University of Alberta

Effects of Foreign Direct Investment in the Canadian Agri-food Industry

by

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ABSTRACT

Through this research five different analyses for the food, beverage and tobacco (FB&T) sub-industry, the dairy, and grain and oilseeds manufacturing sectors will be undertaken. Our analyses will look at the factors that drive FDI into the Canadian agri-food industry, the effects of FDI on trade, as well as its effect on productivity growth. The multinationals (MNE's) choice of entry mode, and a Granger causality analysis will also be subject of our analysis.

The results show a complementary effect of FDI on trade for the (FB&T) sub industry as well as for the grain and oilseeds sector. Findings on the determinants of FDI were also consistent with our expectations. However results of the R&D spillovers effects on productivity growth suggest that MNE's may be exploiting location advantages without generating technological benefits for domestic firms. The choice of entry mode reflects strong protection of proprietary knowledge by MNE's in Canada.

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Table of Contents

Chapter 1 INTRODUCTION 1
1.1 Background 1
1.2 Trade, FDI and Technology adoption in the Canadian agri-food industry 2
1.3 Previous Empirical Work 7
1.4 Research Objective 9
1.5 Outline of the study 10
Chapter 2 LITERATURE REVIEW 11
2.1 Introduction 11
2.2 International activities of the firm 12
2.2.1 Theories of international trade. 13
2.2.1.1 Benefits of trade: 14
2.2.2 What are the alternative strategies to access international markets? 15
2.2.2.1 What is Foreign Direct Investment (FDI)? 16
2.2.2.2 What is a Multinational Enterprise (MNE)? 18
2.2.2.3 What is a joint venture? 19
2.2.2.4 What is a franchise? 20
2.2.2.5 Licensing 21
2.3 Summary 22
2.4 Theory of firm behavior 23
2.5 Theory of the firm (transaction costs) 23
2.5.1 Theory of the MNE. 24
2.5.2 Theories of Foreign Direct Investment: 25
2.5.3 Welfare implications of FDI: 28
2.6 Summary 29
2.7 Empirical observations on the international behavior of firms 30
2.8 Effect of foreign direct investment on export performance. 31
2.8.1.1 Is there necessarily a positive impact of FDI on industrial sector performance? 34
2.8.2 Determinants of multinational enterprises entry mode 35
2.8.3 Spillover effects of FDI on host economies. 39

2.8.3.1 Determinants of productivity: 39
2.8.3.2 Benefits of increasing levels of productivity 42
2.8.3.3 Sources of productivity growth....43
2.8.3.4 Does entry mode affect host country productivity? 45
2.8.3.5 Foreign direct investment determinants and spillover effects on host economies.48
2.8.3.6 Summary 52
2.8.3.7 Empirical work: FDI spillovers in Canada. 53
2.9 Summary 56
2.10 Conclusion 56
Chapter 3 THE CANADIAN AGRI-FOOD, DAIRY, AND GRAIN & OILSEED MANUFACTURING INDUSTRIES; DESCRIPTION AND REGULATIONS..59
3.1 The Canadian agri-food industry. 59
3.2 The Matching Investment Initiative (MII). 60
3.3 Canadian agri-food industry regulations. 61
3.3.1 Market regulation policies 62
3.4 Profile of the Canadian dairy industry 63
3.4.1 Dairy Industry Regulatory Framework 65
3.4.1.1 Federal and Provincial Responsibilities in the Dairy Industry 67
3.4.1.2 International Trade in the Canadian Dairy Sector 68
3.5 Profile of the Canadian cereal grain flour industry. 71
3.5.1 The Grain Companies 72
3.6 Profile of the Canadian oilseeds processing Industry 74
3.7 International Trade in the Canadian Grain and Oilseed Industrial Sector. 77
3.8 The Crow Nest Agreement, the Western Grain Transportation Act (WGTA), and changes in the regulations of elevator tariffs. 79
3.9 Summary 82
Chapter 4 MODEL DESCRIPTION AND RESULTS 87
4.1 Testing for unit root and causality. 87
4.2 Testing for the determinants of FDI 90
4.3 Selection of estimation for models explaining the effects of FDI on TFP growth, import and export performance 93
4.4 Testing for the MNE's choice of entry mode 94
4.5 The model specifications 94

4.5.1 Determinants of FDI in the Canadian agri-food industry 96
4.5.2 Effects of FDI on import and export performance 99
4.5.3 Effects of FDI on TFP growth 103
4.5.4 The MNE's choice of entry mode into the Canadian Agri-Food industry 108
4.5.5 The Data 111
4.6 Findings, unit root and causal relations 113
4.7 Regression results 115
4.8 FDI determinants in the absence of trade agreements 135
4.8.1 Exports in the absence of FDI 136
4.8.2 Imports in the absence of FDI 138
4.8.3 TFP growth in the absence of FDI 140
4.9 Summary 142
Chapter 5 CONCLUSION 143
5.1 Analysis outcome 144
5.1.1 Policy implications 151
5.2 Further studies and limitations 153
Reference list 156
Appendix A 171
Appendix B 171
Appendix C 172
Appendix D 172
Appendix E 173
Appendix F 173
Appendix G 174
Appendix H 174
Appendix I 175
Appendix J 175
Appendix K 176
Appendix L 176

Appendix M.....177
Appendix N.....177
Appendix O.....177
Appendix P.....178
Appendix Q.....178
Appendix R.....178
Appendix S.....179
Appendix T.....179
Appendix U.....179
Appendix V.....180
Appendix W.....180
Appendix X.....180
Appendix Y.....181
Appendix Z.....181
Appendix AA.....182
Appendix AB.....183
Appendix AC.....190
Appendix AD.....197

List of Tables

Table 2-1 Literature review: Effects of FDI on trade performance 33
Table 2-2 Literature review: The MNE's choice of entry mode 39
Table 2-3 Literature review: Determinants of FDI 50
Table 2-4 Literature review: Technological spillover effects from FDI 54
Table 2-5 Literature review: FDI and TFP growth in Canada 57
Table 3-1 Matching Investment Initiative (MII) 61
Table 3-2 Top companies in the Canadian dairy sector 65
Table 3-3 Dairy industry policy and trade events 70
Table 3-4 Top companies in the Canadian grain handling business 74
Table 3-5 Oilseeds processing plants in Canada 75
Table 3-6 Refining oil plants in Canada 76
Table 3-7 Grain and oilseeds sector policies and trade events 80
Table 4-1 Expected signs, Determinants of FDI 99
Table 4-2 Expected signs, effect of FDI on exports 101
Table 4-3 Expected signs, effects of FDI on imports 103
Table 4-4 Expected signs, effects of FDI on TFP growth 108
Table 4-5 Expected signs, MNEs choice of entry mode 110
Table 4-6 Determinants of FDI in the FB&T sub industry (1972-2001) 117
Table 4-7 Results: Determinants of FDI, FB&T sub industry (1987-2001) 117
Table 4-8 Results: Determinants of FDI, dairy manufacturing (1987-2001) 118
Table 4-9 Results: Determinants of FDI, grain manufacturing (1987-2001) 119
Table 4-10 Comparison of studies on determinants of FDI 120
Table 4-11 Results: Effect of FDI on exports, FB&T sub industry (1972-2001) 121
Table 4-12 Results: Effect of FDI on exports, FB&T sub industry (1987-2001) 122
Table 4-13 Results: Effects of FDI on Exports, dairy manufacturing (1987-2001) 122
Table 4-14 Results: Effects of FDI on Exports, grain manufacturing (1987-2001) 123
Table 4-15 Comparison of studies on the effects of FDI on exports 124
Table 4-16 Results: Effect of FDI on imports, FB&T sub industry (1972-2001) 125
Table 4-17 Results: Effect of FDI on imports, FB&T sub industry (1987-2001) 125
Table 4-18 Results: Effects of FDI on imports, dairy manufacturing (1987-2001) 126
Table 4-19 Results: Effects of FDI on imports, grain manufacturing (1987-2001) 127
Table 4-20 Comparison with other studies; effects of FDI on imports 127

Table 4-21 Results: Effects of FDI on TFP growth, FB&T sub industry (1972-2001).....128
Table 4-22 Results: Effect of FDI on TFP growth, FB&T sub industry (1987-2001).....129
Table 4-23 Results: Effects of FDI on TFP growth, dairy manufacturing (1987-2001).....130
Table 4-24 Results: Effects of FDI on TFP growth, grain manufacturing (1987-2001).....130
Table 4-25 Effect of FDI on TFP growth using trade values, FB&T (1987-2001).....132
Table 4-26 Effect of FDI on TFP growth using trade values, Dairy manuf. (1987-2001).....132
Table 4-27 Effect of FDI on TFP growth using trade values, grain manuf. (1987-2001).....134
Table 4-28 Comparison of studies on the effect of FDI on TFP growth.....134

List of Figures

Figure 1-1 Market share, FB&T sub industry (total sales) 2
Figure 1-2 TFP by industry 5
Figure 1-3 Labor productivity by industry 6
Figure 1-4 Value of shipments by industry 6
Figure 1-5 Number of establishments by industry 7
Figure 2-1 Three Panel Trade Diagram 14
Figure 2-2 Differences between a franchise and a license agreement 22
Figure 3-1 Dairy coops market share 66
Figure 3-2 FB&T and Dairy products imports 69
Figure 3-3 FB&T and Dairy exports 69
Figure 3-4 Grain and oilseeds co-ops market share 73
Figure 3-5 FB&T and grain and oilseeds exports 78
Figure 3-6 FB&T and grain and oilseeds imports 78
Figure 3-7 FDI process and thesis objective 85
Figure 4-1 TFP growth and domestic R&D investment for the FB&T sub industry 104
Figure 4-2 TFP growth and foreign R&D investment in the FB&T sub industry 104
Figure 4-3 FDI determinants simulation, FB&T industry 136
Figure 4-4 Exports simulation, FB&T industry 137
Figure 4-5 Exports simulation, Dairy sector 137
Figure 4-6 Exports simulation, Grain and oilseeds sector 138
Figure 4-7 Imports simulation, FB&T industry 138
Figure 4-8 Imports simulation, Dairy sector 139
Figure 4-9 Imports simulation, grain and oilseeds sector 139
Figure 4-10 Simulation TFP growth, FB&T sub industry 140
Figure 4-11 Simulation TFP growth, dairy manufacturing sector 141
Figure 4-12 Simulation TFP growth, grain and oilseeds manufacturing sector 141

Chapter 1 INTRODUCTION

1.1 Background

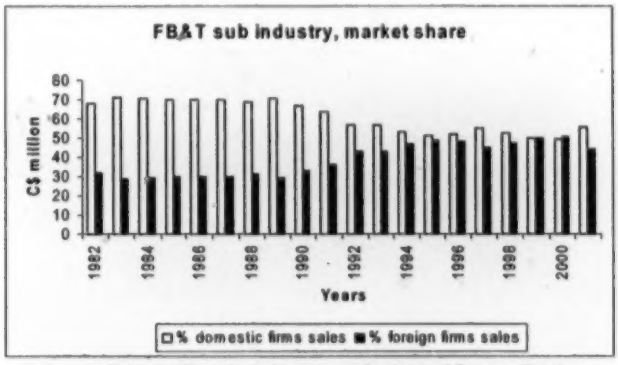
During the last few decades, world economies have been involved in a continuous integration process, with the Uruguay Round of trade talks resulting in a move towards domestic market liberalization. During this process, some economies such as the U.S. and the E.U. have strengthened their positions as economic powers, closed economies such as Russia and China have opened their frontiers to trade and some other economies in Latin America have faced serious threats to their national economic structure. The birth of important trade areas such as the European Union (EU), The North American Free Trade Agreement (NAFTA), the Mercosur, among others have been an "economic success"; however liberalization is not a "free for all", in some cases society has the need to claim protection from the strongest foreign players in order to reach some degree of equity in this new globalization era.

Nations have always been involved in trade, and agricultural trade has always been a valuable asset among nations. After the Second World War, trade in agricultural commodities grew significantly, and trade in processed food was almost non-existent, however since the early 60's the processed food industry started emerging internationally. By the 70's, the value of world trade in agricultural commodities and processed foods worldwide was $65 billion (Henderson et. al. 1996) of which 50% was trade in processed foods. By the mid 90's the value of international trade in processed food products increased from $38 billion to $256 billion, an annual rate of growth of almost 10%, equivalent to two thirds of the global trade in agricultural products and commodities (Henderson et. al. 1996).

As well as trade, foreign direct investment (FDI) is playing a leading role in the globalization process. Foreign direct investment (FDI) may be responsible for this vertiginous increase on international activities. Many countries around the world have encouraged foreign investment by subsidizing industrial activities or by a low tax scheme. During the last two decades, production by foreign affiliates has been shown to be growing faster than exports in a ratio of 3:1. The impact of FDI on trade has raised several concerns about the real impact of FDI on national industries. Questions remain about the links between FDI and trade and FDI and the status of national industries.

1.2 Trade, FDI and technology adoption in the Canadian agri-food industry

During the last 20 years, Canada has pursued an aggressive trade oriented policy. During this period, Canada became the seventh largest trader worldwide and positioned itself as an interesting magnet for foreign investment. Even though most of the inward FDI is focused on the aeronautical, automotive and computer industries, the Canadian food and beverage and tobacco (FB&T) industry has an important share of foreign ownership, over 25% by 1995 and sales by foreign subsidiaries in the FB&T sub industry account for over 50% of total sales (Figure 1-1).



Source: Statistics Canada, Industry organization and finance division

Figure 1-1 Market share, FB&T sub industry (total sales)

The economic importance of the Canadian agri-food industry is based on the fact that it is the third largest employer in the country and accounts for about 8.5% of the Canadian gross domestic product. It also employs about 1.9 million Canadians in the process of production to sales at the retail level. The country is well known as an efficient agricultural producer and exporter with strength based on five major products: (Belhadji, Cagne and Roy, 2000):

1. Bulk grains which accounted for $4.4 billion
2. Meat and meat by products which accounted for $3.9 billion
3. Live animals accounted for $1.7 billion
4. Oilseeds and seeds for sowing $2 billion
5. Vegetables accounted for $1.7 billion

Historically, it has been argued that Canada's manufacturing firms are relatively small due to the country's small domestic market and due to the protection by tariff and non tariff barriers of the domestic industry. Rao (1988) argued that "smallness is often accompanied by sub optimal plant scale, sub optimal production runs as well as major structural weakness" reflected mainly in low R&D activity, slow diffusion of technology, and high debt to equity ratios. As a result, Canadian

manufacturing firms are said, on average, to be substantially less efficient than their U.S. counterparts (Rao, 1988). By promoting FDI inflows, Canada's expectations are to be able to capture foreign technology, which together with domestic technology could eventually decrease the technology gap, as well as to increase domestic living standards.

Increasing FDI inflows in the Canadian FB&T industry apparently has had an impact not only on trade and technology, but also in the FB&T industry structure. Cooperatives have played a crucial role in the agricultural sector of the Canadian economy, especially in farm supply and the processing and marketing of grains and oilseeds (until recently cooperatives were 49% of the market), milk and dairy products (in which cooperatives until recently accounted for 66% of the overall market), meat, vegetables and other products. During the last decade, some agricultural co-ops have become private and some have accepted foreign investment as a business strategy for success or survival. Both the dairy and grain and oilseeds manufacturing industries have seen structural change associated with FDI in their industries.

The only published study by Agriculture Canada (Vaughan, 1995) about FDI in the Canadian FB&T manufacturing industry implies positive effects of FDI for the Canadian industry. Vaughan mentioned that for the FB&T industry, sales of U.S. foreign affiliates in Canada are three times higher than exports from U.S. to Canada, while sales of Canada's affiliates in U.S. were twice as high as exports to U.S., however she questioned the ability of small Canadian enterprises to compete against multinationals with high percentage of market share, as well as the presence of R&D spillovers for the domestic industry. Studies have shown that those plants that manage to successfully incorporate advanced technologies into their production process experience larger productivity gains and higher economic growth than plants that do not adopt these technologies. The Canadian food processing industry is heavily reliant on product market regulation due to concerns about food quality and safety and the fact that productivity growth in the food-processing sector has been lagging behind than the rest of the manufacturing sector is a topic that should be investigated (Baldwin and Sabourin, 2002).

Overall, the reasons for the use of new technologies are to obtain gains in labor productivity, to produce higher quality products and to enhance labor skills. Baldwin and Sabourin (2002) performed a survey in the Canadian food processing industry in order to determine the main obstacles facing domestic firms in adopting new technologies, with the costs associated with the integration and operation of new technologies the main obstacle followed by food safety regulations, financing, skill shortage and management. This brief overview of technology

adoption by the Canadian food processing industry could explain the reason why domestic firms have been merging with foreign enterprises; multinational firms are playing an important role in the global diffusion of advanced technologies. Caves (1982) stated that expansion across national borders is related to the need to exploit and to transfer skills that are related to marketing or technology. Multinationals are seen to possess superior access to advanced technology (Blomstrom and Kokko, 1997); the advantages of multinational firms are usually related to size, expertise (knowledge) and financial resources, which are often related to a higher propensity to new technologies.

Analyses done at the manufacturing level of aggregation seem to imply that the outcome for an aggregated industry would be the same for each of its components and that is not necessarily correct. A disaggregated view of the food, beverage and tobacco sub-sectors such as the dairy, grain and oilseed sectors will allow us to study specific regulatory and industry characteristics and its their effects on FDI. Prior studies have focused on aggregated levels of analysis that restrict the ability to formulate policies for targeted industrial sectors possessing unique regulatory features. A disaggregated analysis will allow us to also consider the effects of foreign technological spillovers on specific industry sectors (dairy, and grain and oilseeds manufacturing sectors), given that spillover effects are not uniform across industries. A disaggregated level of analysis will then capture these effects, in conjunction with specific regulatory conditions of each sector. Both aspects have not been addressed in previous empirical literature. But more importantly, is that such a level of analysis will allow us to consider and draw implications for existing and potential policies that impact FDI behavior in these different sub-industries.

Every industrial sector has specific factors that could influence the overall industry in a different direction. The theory of the MNE mentions that in order to invest abroad, a MNE should be able to exploit a domestic advantage that in addition to its own competitive advantage will be sufficient to compete against domestic firms. Therefore, the presence of foreign capital in these highly regulated sectors should be in response to some positive expectations from these regulations. The possible links could be:

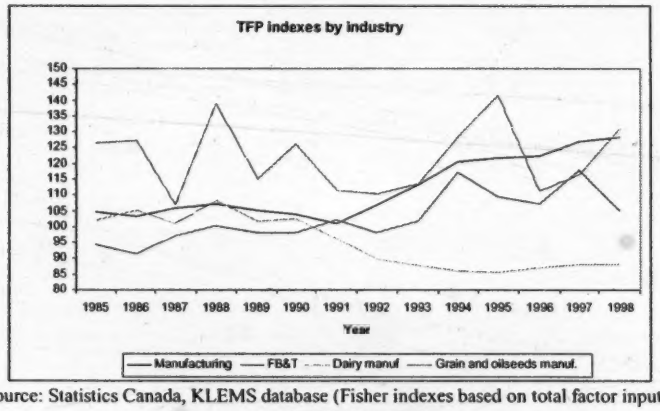
1.- MNEs in the grain and oilseeds sector are taking advantage of the CWB dependence on private infrastructure for grain elevation and trade. This dependence could be seen by MNEs as an opportunity to profit through elevation rates.

2.- MNEs in the dairy sector could be taking advantage of high import tariffs. Import tariffs might be seen as an efficient protection against foreign competition. Parallel to tariffs, the regulation of dairy production (quotas) and guaranteed prices could also be seen as an opportunity to profit (given the high domestic prices) with a secure market.

3.-Foreign investment in both sectors could also be seen as an opportunity to control the domestic market and production given that under the WTO agreement the participation of state enterprises is under question. The perception of the possible future disappearance of the CWB and the supply management system could be of benefit for MNEs once the sectors are fully consolidated.

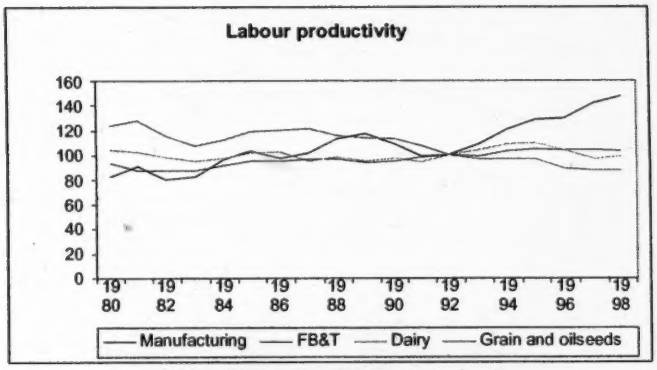
Figures (1-2 to 1-5) illustrate that every subcomponent of the FB&T industry is reacting differently to external factors. Therefore the impact of FDI on each sector is expected to be different. The specifics of each of them could give the sector the ability to "obtain more or less" of the implied FDI benefits (i.e. R&D spillovers, increasing trade activity, increasing real income, etc), and at the same time, the specific sector characteristics will dictate the way that foreign investors will enter the market and conduct business.

Figure (1-2) illustrates the behavior of TFP growth for different levels of industry aggregation. As can be observed, for most of the years in the illustration, the productivity trends are not constant. The positive growth of the manufacturing industry for most of the years in the illustration is not parallel to the growth trends for either the manufacturing industry, or the FB&T industry or each of the sectors. A similar pattern can be observed in Figure (1-3), where labor productivity indexes are also different among different industry aggregation levels.



Source: Statistics Canada, KLEMS database (Fisher indexes based on total factor inputs)

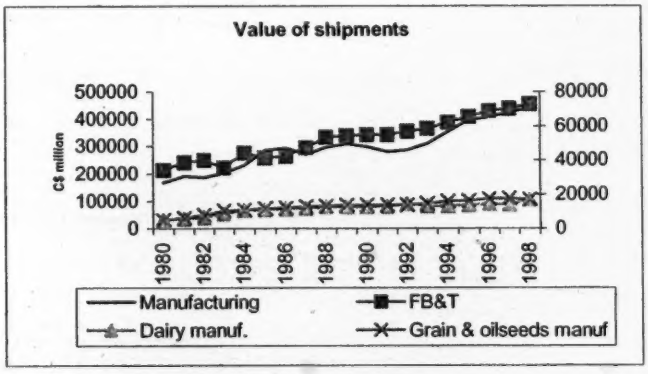
Figure 1-2 TFP by industry



Source: Industry Canada (www.strategis.ca)

Figure 1-3 Labor productivity by industry

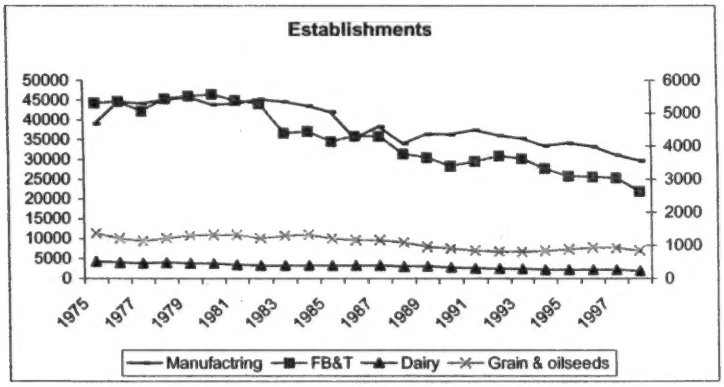
The percentage growth in the value of shipments (Figure 1-4) also provides a good example of the importance of disaggregating this analysis. It can be can observed that the growth levels also go in opposite directions in some years (i.e. 1984, 1987, 1998) and the growth levels are also different (i.e. in 1998 the value of shipments for the manufacturing industry increased less than 10% while for the dairy manufacturing sector grew over 20%).



Source: OECD STAN database (several volumes).

Figure 1-4 Value of shipments by industry

The decrease in the number of establishments throughout the manufacturing industry is a consequence of industry consolidation. Figure (1-5) illustrates this downturn in the number of establishments throughout the industry; however the components of the manufacturing industry (FB&T sub industry and mainly both sectors) show a more consistent negative trend than the one for the manufacturing industry, which has ups and downs.



Source: Manufacturing industries of Canada: National and Provincial areas. Catalogue 31-203-XPB

Figure 1-5 Number of establishments by industry

1.3 Previous Empirical Work

Multinational firms perform a significant amount of global marketing of processed foods. It is expected that FDI would have some effect on the balance of trade of the host and home countries, it may also affect the demand for labor, real income, consumption, technological innovations and technology transfer. The positive or negative effects of FDI tend to be different for each industrial sector and for each individual country. The different outcomes of the effects of FDI on specific nations or industries, suggest that the effect of FDI is conditioned to the MNE's needs, i.e. if the MNE is oriented to internalize part of their operation (in order to vertically integrate), the effects of FDI on trade could increase intermediate and/or final products exports from the host country, with the possibility of having a greater technological spillover in the host country. However, if the MNEs objective is to penetrate a foreign market, the effects of FDI on trade could be an increase in imports of final products (horizontal integration).

In the literature, the effect of FDI on national balances of trade has been discussed, the actual policies of industrialized nations of increasing the exports of high value products may arise from concerns about the relationship between FDI and trade (as complements or substitutes), governments have shown concern about the ability of multinationals to generate or displace exports from the home country. Previous research has not found conclusive evidence of a pattern that could relate FDI to complementing or substituting for trade, the fact that world economies have different rates of welfare, industrial productivity, degree of development and even natural resource endowments, does not allow researchers to forecast accurately the effects of FDI on

national trade balances. Gopinath, Pick and Vasavada, (1999) evaluated the effects of FDI on trade for the U.S. food industry finding evidence of substitution between foreign sales and exports for the U.S. food industry. Henderson, Handy and Neff (1996) performed an analysis comparing sales growth of exports and foreign affiliates; they did not find evidence of a relationship between exports from the home country and foreign affiliates sales. There seems to be evidence that provides support for both the displacement and creation of exports from foreign direct investment. Pain (1998) performed a study in which he evaluated the export performance and the role of FDI in OECD countries, concluding that outward investment has generally a negative impact on the balance of trade, while inward investment has generally a positive one. However, it seems that the degree of development of individual countries also determines the effect of FDI on trade balances. Werner (1996) analyzed the reasons why firms choose to invest in advanced industrial nations or developing countries, his findings were that firms used FDI in advanced industrial nations for market access, increasing import levels in the host country, while firms perform FDI in developing countries in order to gain resource advantages increasing the export level of the host countries. Leichenko and Erickson (1997) evaluated the effects of FDI on the manufacturing export performance of U.S. states; their findings were that increasing levels of FDI were positively related to future improvements in state manufacturing export performance. Research has also been done in order to evaluate the impact of FDI on specific industrial sectors of different nations; however industry specific characteristics have not allowed researchers to accurately predict the effects of FDI. There seems to be a relationship between the degree of development of the specific country and the degree of FDI presence in a specific industry as the determinants of the positive or negative effects of FDI in the host country. Aitken et. al.(1999), studied the impact of FDI in Venezuelan's manufacturing firms showing that the technology gains from FDI were entirely captured by joint ventures, there were no positive effects for domestic industry. Girma (2001) did not find aggregate evidence of intra-industry spillovers for the U.K. manufacturing industry, however he found a positive but low level of benefit for domestic firms as compared with the high level of productivity achieved by foreign firms. Haddad (1993) conducted research related to the effect of FDI in the Moroccan manufacturing industry while Feinberg (2001) conducted research related to the Indian Pharmaceutical industry finding that FDI did not have a positive effect on industry growth for domestic firms and that the only positive significant spillover effect of FDI was among foreign owned firms.

Increasing FDI inflows could be a response to an accelerated industry concentration and change of industry ownership. This change has also raised questions about a growing technology gap between domestic and foreign industries (Chung and Tang 1999; Rao and Tang, 2000; Rao, 1988) and its not clear if foreign MNEs are contributing to domestic productivity growth through technological spillovers. An important discrepancy is the fact that nations are promoting FDI inflows under the belief that FDI will contribute to productivity growth; when one of the main premises of the theory of the firm (which will be discussed in further detail in the following chapter) is the protection of proprietary knowledge. By performing an industry-disaggregated analysis and by using sector specific data, we are expecting to capture with higher accuracy the impact of FDI. Furthermore, we will illustrate that one of the reasons for previous research having inconsistent results is the fact that most of the analysis has been done for aggregate industries leaving out sector specific characteristics, which are the ones that eventually would determine the positive or negative effect of FDI for an economy.

1.4 Research Objectives

Knowledge is what triggers the existence of FDI. From one side, host countries are expecting to incorporate foreign technology into their production process and are working towards creating an adequate environment to attract FDI (FDI determinants). The presence of FDI is expected to create an increasingly competitive environment with domestic firms, which could trigger trade activity (by complementing or substituting imports/exports) and provide domestic consumers with more choices. On the other side, before investing, foreign investors take all possible measures to protect their competitive advantages (knowledge) by deciding on the way to enter a new market, with out providing their host competitors with the "tools" that represent their advantage that offseting the cost of operating abroad.

Based on the previous discussion, and considering the growing share of foreign ownership in the Canadian agri-food industry, the contributions of this research are to evaluate the effects of FDI on productivity growth through technological spillovers, and the effects of FDI on trade (evaluating if a complementary or substitution effect exists between imports/exports and FDI) in the Canadian food and beverage sector. This project will also evaluate the main determinants of inward FDI, and the factors that affect the MNE's choice of entry mode in the Canadian agri-food industry, specifically the protection of proprietary knowledge. The analysis for the MNEs choice of entry mode is motivated by the theory of the MNE which states that MNEs would expand

operations abroad by exploding host country competitive advantages together with its own competitive advantages (proprietary knowledge). Directional causal relations will also be analyzed in this project.

By disaggregating our analysis to the sector industry level, we will attempt to capture not only the way those specific sector characteristics (regulatory environment: supply management and the Canadian Wheat Board) are influencing FDI inflows, but also the existence or lack of FDI benefits to the specific sectors under analysis (technological spillovers and higher trade activity). Therefore, the primary objective of the research is to specifically:

Evaluate the effects of FDI on:

- Productivity growth through technology spillovers
- Trade (Complementary or substitute relation of FDI with domestic import/exports)
- And to determine the attractors of inward FDI as well as the determinants of MNEs choice of entry mode (MNEs will elect the entry mode that better protects their competitive advantages and lower the risk of operating abroad).

first, in the Canadian food and beverage sub-industry, and further, for the dairy and grain and oilseeds products manufacturing industries.

The two major subcomponents of the food and beverage sub-industry, dairy and grain handling are both interesting sectors. In each case the domestic regulatory environment affects the domestic industry structure and performance (Canadian Wheat Board, and supply management).

1.5 Outline of the study

This study is divided into five chapters. This first chapter provides background information about the globalization of the food-processed markets, evolution of trade, FDI and technology adoption by the Canadian agri-food industry. Background related to causes and implications of FDI, on exports, imports, productivity growth, and the multinationals (MNE's) choice of entry mode will be discussed in more detail in Chapter 2. Chapter 3 will include a detailed description of the food, beverage and tobacco (FB&T) sub-industry and the dairy, and grain and oilseeds products manufacturing sectors that are the subject of analysis in this project. Chapter 4 will include the description of the models, and data sources to be used in this research as well as the empirical results of the analysis. Lastly, conclusions and implications from the study are presented in Chapter 5.

Chapter 2 LITERATURE REVIEW

2.1 Introduction

"Rapid changes in comparative advantages and technology, as well as global competition for markets, capital, skilled labor, and technology have facilitated the internationalization of the activities of transnational corporations" (Rao et. al. 1994). Companies are adopting strategies complementary to exports to improve their competitiveness and to reduce risks associated with their investments in physical and human capital, as well as in R&D. These strategies include mergers and acquisitions, greenfield investments, joint ventures, licensing, and franchising. At the present time, countries are encouraging the attraction of new knowledge to their national industries through tax incentives. Current international agreements and technologies are making the movement of knowledge around the world easier and faster than the movement of goods.

The eclectic theory of the multinational enterprise (MNE) affirms that the main motivation that drives firms to invest abroad is the possession of specific advantages that offset the costs of operating across national and cultural boundaries. There is a possibility that foreign firms perform FDI to source raw materials, to achieve lower production costs and knowledge and might still use exports as a tool to avoid the spread of their internal knowledge or advantages across boundaries. To date, empirical work has not been able to reach a general agreement on the spillover effects of FDI on national economies and industries, there is still an ambiguous answer about the complementary or substitutability of FDI and trade. It seems that overall domestic specific circumstances, as well as MNE's strategies to penetrate foreign markets affect the outcomes to these questions.

Specifically, the objectives of this thesis are to evaluate the effects of FDI on:

- Productivity growth through technology spillovers
- Trade
- And to determine the main attractors of inward FDI as well as the determinants of the MNE's choice of entry mode.

The present chapter is organized as follows:

First, given that the effects of FDI in the Canadian industry is the main focus of this work, this chapter provides a brief description of the concepts of foreign direct investment, multinational

enterprise, and the different methods of international transactions. The theory of the MNE was the pioneering study about multinational organizations. Through this chapter, a description of theories related to the evolution of the firm and trade that derive from the theory of the MNE (which is the basis for this research) will be introduced, followed by a section about empirical work related to the objectives of this thesis. The chapter will end with a summary that will include a discussion about FDI determinants, spillover effects, effects on export/import performance as well as the factors that influence a MNE choice of entry into a new market.

2.2 International activities of the firm

Several centuries ago, trade among individuals, native groups and nations existed but trade has also evolved with world evolution. In modern times, after the Second World War, exports were the single existent mode for penetrating international markets; in the last three decades foreign direct investment (FDI) has arisen as an alternative and efficient way to penetrate foreign markets. International trade takes place whenever the domestic price ratios of different commodities are not the same in the trading countries; differences in production possibility curves for different countries constitute an important reason for the existence of trade. International trade has played an important role in world economic growth; the volume of world trade has increased during the last decades and has been doubling approximately every decade since the 1940's (Heller, 1973). Exports are often the first mode of entering a new country; the attractiveness of exporting depends on transportation costs and duties, relative to product value, costs of alternatives and market and business strategies. Exports are considered to be the least expensive and least risky way to gain some knowledge of external markets and are also considered a good alternative for building "consumer recognition", however in many cases exports are the least profitable option given the efficiency of the new methods to serve foreign markets.

The motivations to export are based on production and transportation costs:

- Production cost considerations include the relative availability, quality and price of raw products and other inputs and economies of size which allow an industry to manufacture a product or to provide a service of good quality at a lower price than a foreign industry.
- Transportation costs and the ability to respond quickly to customer needs, transportation costs can affect the competitiveness of the price in a foreign market.

During the last three decades, world exports of raw and manufactured products have been increasing, however the use of new alternatives to penetrate international markets such as FDI, licensing, franchising, joint venturing among others have also increased. The evolution of the other strategies has weakened exports as the main strategy for penetrating international markets. The increasing importance of the other strategies is raising questions about the impact of alternative international transactions on trade performance.

2.2.1 Theories of international trade.

"World output of goods and services are maximized and the economic well being of the people is optimized when a nation specializes in the production of those goods in which it can do comparatively better than other nations" (Nasser, 1971). The classical economists focused their attention primarily on the gains from trade in order to demonstrate that free trade would benefit trading economies; Adam Smith, a classical economist, established the concept of specialization, through this concept he meant the maximization of output and the optimization of economic well being. He supported the idea that trade occurred because each country had an absolute advantage in the production of some commodity (Negishi, 2001). However, years later, Ricardo developed a general theory of international trade in which he stated that only under conditions of free trade would each country specialize in the production of those commodities in which it had a comparative advantage in relation to other nations. These commodities would then be exported in exchange for commodities in which the other countries have comparative advantages resulting in an optimum allocation of resources where all countries will obtain benefits from trade and specialization (Heller, 1973). The opportunity cost theory of international trade states that the relative prices of different commodities are determined by cost differentials, where costs do not refer to the amounts of labor required to produce a commodity but to the alternative production that has to be forgone to allow for the production of the commodity being traded. The Heckscher-Ohlin (H-O) theory was originated by an analysis of the classical theory of international trade, which assumes that different countries have different technologies of production. This theory assumes that countries are characterized by different factor endowments and that there are different factor intensities between products. This theory (considered as the modern theory of international trade) assumes that different countries have identical technologies, which are given in the form of identical production functions. Therefore the comparative advantage of the different countries is explained then not by differences in technology but by the differences in

factor endowments. The H-O theory basically states that the capital rich country exports the capital-intensive commodity and imports the labor intensive one and vise versa. We should note that international trade theory and multinational enterprise theories have had an uneven development with few similarities. Basically trade theory is based on market equilibrium, which does not consider the effect of international firms/multinationals on international trade while the theory of the multinational enterprise is basically focused in the characteristics of individual firms that lead them to multinationality.

2.2.1.1 Benefits of trade

When international trade takes place without any kind of distortion, the level of welfare of countries involved in international trade is then higher than in autarky equilibrium.

The following three-panel trade diagram illustrates the benefits of international trade; this diagram is illustrated under the following assumptions:

Perfect competition is assumed, a single and homogeneous commodity is being traded, the trade takes place between one country and the rest of the world, and there are no market distortions and transportation costs.

Figure 2-1, illustrates country 1 with an excess demand while the rest of the world has excess supply. Under autarky, price in country 1 (a) is higher that price in the rest of the world (b), then when international trade takes place, prices adjust until price in both sides are equal (Pw) and there is no more incentive to trade.

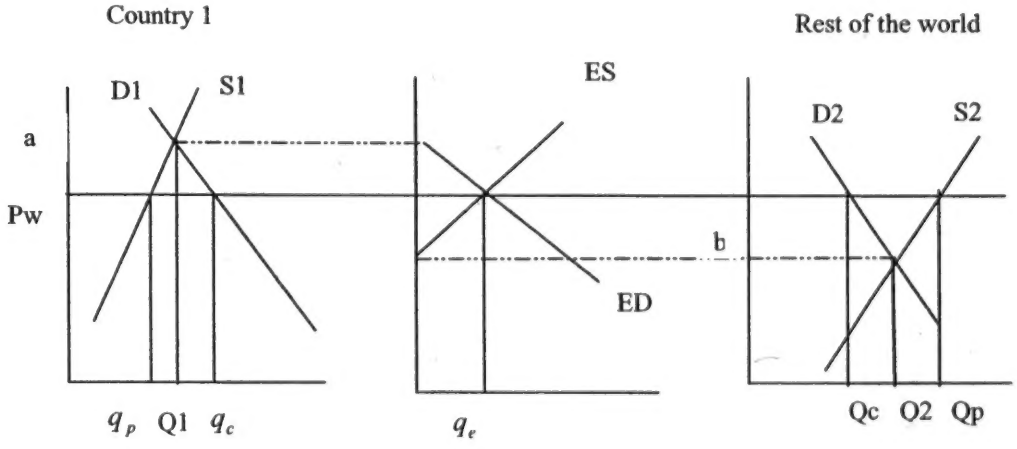


Figure 2-1 Three Panel Trade Diagram

Country 1 increases consumption to q_c and decreases production to q_p while the rest of the world increase their production from Q_2 to Q_p. The gains from trade can be divided into two groups:

- Gains from exchange.- International exchange raises the real income of trading countries because it allows buyers to access goods that otherwise would not be available or would be but at a higher price. Lower foreign prices also allow consumers to buy more goods with the same amount of income (consumers in country 1 can buy more products with the same income, this gain is illustrated from Q1 to qc, however producers in country 1 decreases production and loses due to lower international prices). Consumers in country 2 lose because with trade, they buy less with the same income (Q2 to Qc), however production in this country increases due to higher international prices.
- Gains from specialization.- Specialization permits a nation to produce more exports goods than the ones demanded by its population, therefore the excess of production is usually traded for less costly imported goods from over the world providing a wider diversity of products and prices to consumers than if every product would be produced at home. Trade theory shows that it is a country advantage to specialize (partially) in producing goods for which it has lower per unit costs. Trade stimulates investments and expansion of industries that produce exportable goods and will contract the number of industries with high production costs relative to the international market. This expansion process involves benefits such as employment, domestic and foreign investment and transfer of knowledge.

2.2.2 What are the alternative strategies to access international markets?

The internalization of knowledge, location advantages, competitiveness, business strategies to expand market share and decrease risk have been some of the factors that have motivated alternative ways to exports to penetrate international markets. Since historic times, international trade was limited to the exchange of goods among nations, however trade has evolved with history; even though after the second world war international trade was dominated by exports, producers are now offering "the way to make things" abroad; increasingly, products that used to be imported are now being made locally and not shipped around the world. Business people are now prepared to buy knowledge in order to find the most cost effective way to develop new

business. Multinational enterprises, franchises, licensing and joint ventures are current internationalization tools that are displacing exports as the main way to perform international trade.

2.2.2.1 What is Foreign Direct Investment (FDI)?

FDI occurs when a foreign firm has a stake of at least 10% or more in a domestic operation. FDI is "the ownership of assets by a foreign firm for the purpose of controlling the use of those assets" (Vaughan, 1995). Expansion by FDI means higher costs of management; advantageous location is not enough to explain location of subsidiaries. Unless multinationals possess an advantage over local firms sufficient to offset the cost of international coordination, domestic firms will capture the benefits of location. In the latter case the foreign company's advantage may be shared with domestic firms in the preferred location through licensing or other types of long term contracts.

Foreign direct investment can take two forms, greenfield investment and mergers or acquisitions (Vaughan, 1995):

a) **Greenfield investment.-** This kind of FDI entails construction of a new physical plant.

b) Another FDI alternative is **mergers or acquisitions**. By merging, a MNE acquires partial ownership and control of a domestic firm; otherwise an acquisition implies that a MNE will fully buy a domestic firm (does not entail construction of a new plant).

Most FDI occurs by acquisition or merger rather than by building new facilities (green field investment) due to the costs that the parent firm faces in order to build new infrastructure for the company, these costs can be lowered by merger with or acquisition of a host country industry.

A reason for firms to become international could be a slow growth in domestic markets or the "need" to control an increasing proportion of the international market for their product as well as interest in capitalizing their intangible goods assets (i.e. production and marketing skills). This is leading to greater integration of markets through both trade and investment. The reasons for more FDI are both economic and strategic. In particular, FDI provides firms with more control over brand and market development than do exports.

Vaughan (1995) and Caves (1996) mention the following factors as FDI attractors:

- Barriers to trade. - Government policies and programs can influence cost and product competitiveness, standards and regulations such as tariffs and quotas tend to increase cost for

exporters countries and reduce international trade, therefore FDI is an option to supply a foreign market avoiding higher costs represented by trade regulations.

- Lower production costs.- Countries with low wage rates and strategic geographical positions (among other criteria such as social and economic stability, infrastructure, etc.) are options for FDI because of reduction in production costs and the ability of supplying different markets at a lower cost due to their geographic location.
- National resource endowments.- Many agricultural inputs are available at competitive world market prices, the price of raw ingredients affects the decision of whether to produce in a domestic or a foreign country. Production costs can decrease if raw materials and intermediate goods can be obtained in the domestic market at a lower price. Imports of some of these goods are often necessary to produce the final good.
- National infrastructure. - Transport costs represent an important cost faced by industry, in order to lower them, infrastructure such as roads, communications, maritime ports, rail ways, etc. needs to be available. A relatively high cost of delivery (freight, duties, perishability, etc.) in terms of unit value encourages local production.
- International trade agreements.- Uncertainty with regard to trade policies and border restrictions can be especially damaging when investment decisions are being made.
- Environmental policies. - Some countries have strict environmental policies and force industry to expend high amounts of money in order to be environmentally friendly, countries with "softer" policies keep industry away from these expenses.
- Intellectual capital. - National and international policies affect the creation of intellectual capital and the protection of intellectual property. National policies are essential to stimulate R&D and it's protection.
- Host country taxation and growth on population and income (of host country). - Can influence the investment climate as perceived by firms and then the FDI. Higher taxes in some goods (i.e. luxury goods, tobacco, etc) can decrease domestic consumption. Population growth means a large market but the relation between population growth and purchasing power is important in considering the host country as an attractive market for FDI.

2.2.2.2 What is a Multinational Enterprise (MNE)?

In recent years, multinational enterprises have emerged. In a market economy, successful industries are the ones that have better patterns of enterprise organization and profits, these organizations can vary from being a single plant industry to a MNE. The MNE is defined as an "enterprise that controls and manages production plants (subsidiaries) located in at least two countries" (Caves, 1996). They usually enjoy certain advantages that allow them to operate in different markets; however their prevalence varies among sectors and among countries. MNEs are a consequence of FDI because MNEs represent foreign capital and the control of proprietary assets interacting with "indigenous" capital with the objective of accessing a foreign market. Casson (1987) stated that the issue that dominates the economic theory of the MNE is the exploitation of proprietary knowledge because it is an internationally transferable asset and positively encourages multinational operations; however transaction costs also play an important role in the economic theory of MNE.

Froot (1993) classified the structure of the MNE as either horizontally and vertically integrated:

1. **Horizontally Integrated MNEs-** Usually produces the same kind of goods in all its plants wherever they are geographically located. Horizontally integrated firms internalize the market for proprietary assets (intangible goods), the assets of a particular firm can differ on productivity among companies that produce similar goods, and these assets are mobile and are characterized to have a large lifespan.

   In order to justify the existence of an horizontally integrated MNE advantages such as location and transaction costs are required, but it's also important to consider that the marginal cost of intangible assets is close to zero, implying that for an efficient allocation of resources, the price of the intangible asset should also be zero, therefore no economic profit would be achieved by trading non tangible assets.

   Location advantages are intended to justify the dispersion of production plants in different geographies, however in order to have location advantages they have to be linked with transaction cost advantages which states that MNE's will exist only if the plants that they control and operate have lower production costs or higher revenues than the same plants under independent managements. (Froot, 1993)

2. **Vertically integrated (VI) MNEs-** Can also be explained by transaction costs advantages, the vertically integrated firms internalizes a market for an intermediate product. This structure is based on the coordination of an upstream activity and a downstream activity

within a production sequence linked by an intermediate good that is not considered a public good.

The main factors that influence the decision to vertically integrate are:

a) Technical factors -Because the technical aspect of production rises two distinct issues, the first is the inability of arms length contracts to cope with rigidities of the production process (fixed cost). And the second one is the tendency to distort substitution decisions concerning to those parts of the process that are flexible (without VI is difficult to relocate resources in a short period of time).

B) Market power factors- Are basically concerned with the distortion of intermediate product prices arising from the exercise of monopoly power. The MNE can avoid these distortions by integrating the intermediate product to its production process.

c) Dynamic factors - Refers to the division of labor. The innovation of a new technology often modifies the division of labor and creates a new set of intermediate products. Because the various products are complementary, the producers must synchronize their investment to get all the plants on stream at the same time.

d) Fiscal factors- The best known fiscal factor is the incentive of transfer pricing . It occurs when the accounting price at which intra-firm transactions take place differs from the price that would prevail in an arms length market (Froot, 1993).

2.2.2.3 What is a joint venture?

A joint venture is a business established by two or more parties to achieve a specific purpose, the business usually shares resources and not only monetary investment; this business could be managed by a single party or as by all parties involved in the transaction. Joint ventures originally developed because of the opportunities for complementary economics and to share risk. With complementary economics we refer to economies of scope as well as the accessibility by any of the parties to labor, technology, materials, etc. that could be useful to the other party. Risk sharing is a second reason for joint ventures; risk basically depends on the size of the investment and the degree of uncertainty involved, uncertainty can come from country risk, political instability, from the uncertain outcome of R&D, etc. Gillespie (1990) mentioned that companies prefer to share risk on the cost of investment and R&D by joint venturing instead of jeopardizing their future on a single ambitious project. Gillespie (1990) also mentioned strategic reasons as a reason to form

joint ventures; he said that by joint venturing, a company would have the ability to provide goods and services more effectively and at a lower cost than their competitors. Joint ventures also face some disadvantages, international joint - ventures represent an intercultural and inter-organizational linkage between two separate parent companies that join efforts with different strategic interests and objectives. Cross-cultural differences emerge as a main source of disagreement, strategies expectations, incongruent organizational and operational structures between the partner firms are frequently the sources of conflict in this kind of business alliance.

2.2.2.4 What is a franchise?

One of the methods available for selling commercial knowledge or expertise is the franchising agreement. Franchising is also defined as a method of marketing a product and/or service (Heckman, 1989). Franchising arrangements are divided in two classes:

- Product distribution arrangements in which the dealer is in some degree identified with the supplier.
- Entire business format franchising, in which there is complete identification of the dealer with the buyer

Franchise owners are commonly entitled to use the trademark or name, sell the product or service, have access to "trade secrets", receive management and other kinds of training required to operate the business and have advertising support while their responsibilities are to follow certain kind of pre-established procedures, meet certain standards of quality and to pay royalties to the franchisor.

The franchisee (who acquires the franchise rights) advantages are:

- To access a business with an established product or service name and good reputation.
- The advantage to get technical and managerial assistance provided by the franchisor.
- To have access to existent quality control standards.
- The entrepreneur can open a franchise with less operating capital than running an independent business (financing and inventory advantages).

Franchisees however also face some disadvantages:

- Risk of failed expectations, differences in markets (cultural, social, religious) can be risky for the successful establishment of a franchise.
- High royalties and service costs. In some cases it might be difficult for the franchisor to face this responsibilities due to poor franchise performance.
- Overdependence (restrictions on freedom of ownership). The obligation to follow some stipulated operational rules might obstruct the innovation process of the business.

2.2.2.5 Licensing

Licensing is an efficient way to market technical knowledge. When a company buys a license, the principal objective is to buy the ability to manufacture a product or to use a "piece" of equipment or knowledge, which is safeguarded by a patent. Brook and Skilbeck (1994) defined licensing as "an arrangement between independent organizations for the sale of the use of technology protected by patents, trademarks or other legal forms of monopoly between a principal (licensor) and a client (licensee) which are usually in different countries".

Entrepreneurs use licenses as a viable way to enter a market or strengthen their position in it, for the licensee a license means the opportunity to develop a business without the costs associated with developing the technology, a license is a profitable way to use the existing resources and diversify products and services but could be conditioned by the existence or the capacity of a manufacturing plant. Cultural, political or economic uncertainties are another reason why entrepreneurs prefer licensing, the risk of investing in those countries could be high and licensing provides a mean of establishing facilities anywhere avoiding most of these barriers. For the licensor, the lacks of resources to fund a subsidiary, the lack of managerial skills or the lack of knowledge of the market are motivations to market his knowledge through a license.

The main source of difficulties arises from disputes and misunderstandings between the two parties to the initial agreement, another disadvantage of licensing is the fact that the licensee could establish a competitor to the licensor, once on possession of the technology, a licensee can find means of developing a non agreed business, therefore, the licensor is usually committed to keep developing new technologies to ensure that the licensee will remain dependent.

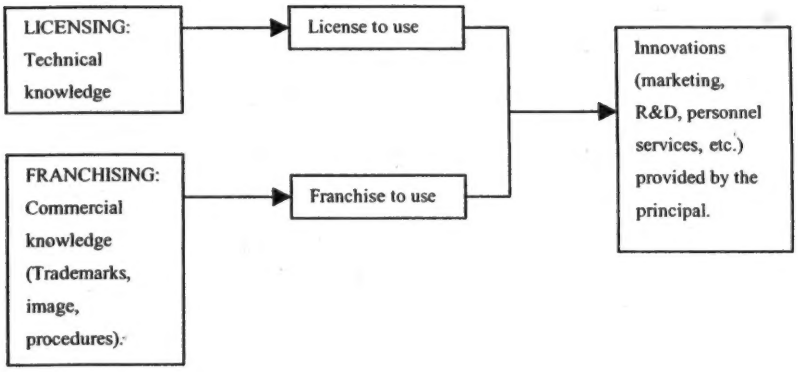


Figure 2-2 Differences between a franchise and a license agreement

2.3 Summary

In this section, the concept of FDI and the different types of international transactions were introduced. FDI is defined as the ownership of assets by a foreign firm for the purpose of controlling the use of those assets (Vaughan, 1995) and it occurs when a foreign firm has a stake of at least 10% in a domestic operation. FDI can be of two forms: greenfield investment, or merger and acquisitions.

Franchising, licensing and joint venturing are different strategies to penetrate new markets. A franchise is a way to market a product or service and allows the franchise owner to use the trademark or name, to sell the products or services and access to the franchise "secrets". A License agreement is a way to market technical knowledge and provides the licensee the ability to manufacture a product or to use a technology protected by a patent. Joint ventures (JV) developed as a way to share the costs and risks involved in the operation of a firm. A JV is defined as a business established by two or more parties with the purpose of achieving a specific objective, which can be managed either by a single party or by all parties involved. What links these international transactions to each other is the need of growth by the MNE who is willing to share profits with the objective of reducing the risks involved in an international transaction but exerting control on the operation of the business and their proprietary assets. For the purpose of this project, our entry mode analysis will be focus on J.V. and acquisitions given that these are the most common choices of entry mode by MNEs in the Canadian agri-food industry.

2.4 Theory of firm behavior

The efficient allocation of resources in a firm depends on an individual who at some point will determine the extent of production under "one roof" and the degree of specialization (Coase, 1937; Williamson and Winter, 1991). In present times, firm behavior is thought to be an evolution of the transaction cost approach developed by Coase in 1937, in which he attributed the success of the firm to the presence of an "entrepreneur" and his ability to allocate resources, leaving the door open for to the possibility of firm expansion. FDI through MNEs can be seen as a result of the evolution of this theory related to the organization of the firm contained in this section.

2.5 Theory of the firm (transaction costs)

The transaction cost approach (Coase, 1937), argued against the traditional belief that the economic system was able to adjust automatically to the price mechanism. Coase's approach is a "reaction" to that previous generalized belief. Overall he stated that in a firm, the allocation of resources are not only determined by the price mechanism, it is determined by an entrepreneur who is able to allocate resources in an efficient way depending on the firm's needs. In this approach the firm is seen as an independent entity, owner of its own resources, these resources are not able to react given market behaviour, therefore the introduction of a third party is "needed" (the entrepreneur) which is able to manage, organize and allocate the resources owned by the firm in order to produce efficiently (reducing production costs and increasing profits) and to adjust production given the firm's and the market needs. The transaction cost approach signals the following factors as motives for the existence of firms:

- The costs of operating a market.- Coase (1937) based this factor on the fact that by forming an organisation and allowing some authority (an entrepreneur) to direct the resources, certain costs could be saved.
- A firm becomes larger as additional transactions are organized by the entrepreneur and smaller as he abandons the organisation of such transactions.

The transaction costs approach mentions that diminishing returns to management are the reason why increasing levels of production could not be carried out by a single large firm, the principle of diminishing returns to management states that as a firm gets larger the costs of organizing additional transactions within the firm rise. "A firm should add transactions until the point where the costs of additional transactions are equal to the costs of the transactions in the open market",

as the number of transactions which are organized "under the same roof" increase the entrepreneur may not be able to make optimal use of factors of production. The transaction cost approach sets the basis of the organization of the firm up to a point where diminishing returns to management makes additional firm activities unprofitable (Coase, 1937; Williamson and Winter, 1991).

2.5.1 Theory of the MNE.

The economic theory of the MNE is developed as a way of analyzing the relations between the overall management of a production process and the management of an individual operation. It is argued that under certain conditions, enterprise problems are less severe when each of the individual operations involved in the process belongs to the same ownership unit. Common ownership gives the high level manager the right of access to information utilized by the lower level managers and so reduces their scope for strategic use of the information at their disposal, however, the issue that dominates the economic theory of the MNE is the exploitation of proprietary knowledge because it is an internationally transferable asset (between the parent firm and its subsidiaries but not always to existing firms in the host country) and positively encourages multinational operations (Casson, 1987). Coase (1937) developed some theories related to the origin of the firm and the internalization of the firm, both approaches are the origin of this research.

Expansion by FDI means higher costs of management, advantageous location is not enough to explain the location of subsidiaries. "Unless multinationals possess an advantage over local firms sufficient to offset the cost of international coordination, the benefits of location will be captured instead by domestic firms. In the latter case the foreign company's advantage may be shared with domestic firms in the preferred location through licensing or other types of long term contracts" (Froot, 1993). Exports or licensing will typically provide lower benefits to MNE's but entail lower costs.

Under the "new" ways to trade, proprietary knowledge (intangible assets) are playing a key role, the ownership of intangible assets gives the owners of these firms the ability to successfully compete in foreign markets against domestic firm; however the ownership of knowledge is often linked to monopolistic or monopsonistic schemes which implies important amounts of market power owned by a few firms leading to questions about the benefits derived from FDI.

2.5.2 Theories of Foreign Direct Investment:

The evolution of some approaches and theories related to the organization of the firm and international production are the basis for explaining FDI. During this section this work will be introduced to set the basis for a good understanding of the behavior of MNEs.

Hymer's international production theory, the transaction cost and internalization approaches might be the most influential work on FDI, however some other theories about FDI also exist:

The Transaction Cost Approach (Coase,1937)

As we discussed before the transaction cost approach argues that the reason why production cannot be carried out by one single large firm is due to diminishing returns to management, it was argued that a firm should increase production and transactions up to the point where the costs of additional transactions are equal to the costs at the open market. Years later, Hymer argued that the market for knowledge was not perfectly competitive, he distinguished two kinds of market imperfections, the first one was associated with market structure which he referred to as the concentration of buying and selling power and the interdependence between oligopolistic firms. The second imperfection was associated with the transaction costs incurred to define property rights and contracts. Both kinds of imperfection are related because both can affect each other (i.e. high transaction costs derived from a lack of information about prices or quality promotes the existence of a monopoly and affects the volume of traded goods).

Theory of FDI or International Production (Hymer 1960).- Hymer stated that firms possessing oligopolistic advantages or firms in a position to benefit from market imperfections, such as economies of scale, product differentiation, etc. may use these advantages to overcome the cost and risks associated with producing in foreign markets and competing with other firms in host countries. Oligopolistic firms may find it more advantageous to set up foreign affiliates rather than export to serve foreign markets. The reason why plants in different countries are brought under common ownership and control is because transaction costs incurred in the intermediate products markets can be reduced by internalizing these markets with the firm. Hymer's basic premise was that foreign investors had monopolistic or monopsonistic advantages that allow them to successfully produce and compete in a foreign market. He argued that the market for knowledge is not perfectly competitive and therefore FDI is a better alternative to doing business abroad instead of other existing trade strategies.

Product Cycle hypothesis (Vernon 1966) and Internalization Theory (Buckley and Casson, 1976). Both theories are somehow related, the product cycle hypothesis explains FDI based on

product differentiation, this hypothesis suggests that the way a firm expands output to a foreign market in early stages of a product life cycle is by exports, Vernon stated that the greater the differentiation is, the stronger the working relations are between suppliers and distributors. These relations become more complex as product differentiation increases usually causing timing problems (between suppliers and consumers) increasing the costs of production. FDI could internalize these shortcomings making the production process more efficient and less costly.

The Internalization theory expands Vernon's point of view by emphasizing imperfections in the foreign upstream or downstream markets. Where needed inputs or merchandising and distribution methods are highly specialized, markets for those supplies or marketing services might be difficult to organize. Therefore, faced with imperfect external markets, firms elect to internalize the supply of these critical inputs or distribution and merchandising services, thus entering into outbound FDI in vertically-adjacent sectors. Internalization allows MNE's to better exploit and protect monopolistic ownership advantages and to economize transaction costs.

The Eclectic Theory of the MNE (Dunning 1977).

Dunning explained three reasons for a firm to get involved in international transactions:

a)Ownership-specific advantages or Firm specific advantages.- The endogenous competitive advantages of a firm relative to those of other firms are so called owner ships-specific advantages. These advantages manifest themselves as mobile, intangible assets which are exclusive or proprietary to their owners. (Human capital.- know how, product differentiation.-trade marks, and technology).

b) Location specific advantages.- The exogenous non-exclusive assets of a firm are its so called location specific advantages. These advantages are captured from the environment (foreign market) in which the firm's capital and goods are transacted (i.e. government intervention such as those policies concerning tariffs and non-barriers, and restrictions to FDI).

c) Internalization advantages.- The advantages of administering international transactions within the same firm rather than using external markets are so called internationalization advantages. By internalizing activities within the firm and across countries MNE's are able to reduce transaction costs related to market imperfections. By using affiliates instead of exports to serve foreign markets, MNE's are able to avoid costs associated with trade barriers, and exchange rates. It also allows MNE's to better exploit and protect monopolistic ownership advantages (trademarks, etc.)" (Vaughan, 1995).

In summary, these theories reflect an evolution of the organization of the firm originated by the transaction cost approach. Every emerging theory contributed with a "reason" that could better explains why firms become international. Given the limitation to a single firm organization of the transaction coast approach, Hymer emerged with the theory of the MNE in which he explained that diminishing returns to management (mentioned by Coase, 1937) and the ownership of proprietary knowledge, are reasons that encourage firms to extend operations abroad (by exploiting their knowledge which is of a monopolistic or monopsonistic form). Vernon (1966), Buckley and Casson (1976) went further and stated that the reasons why firms become international are to better exploit and protect monopolistic ownership advantages and to economize transaction costs by internalizing the process limitations that could emerge due to sourcing problem (vertical integration). Dunning's approach is a summary of the previous theories, he mentions that firms become international to exploit proprietary knowledge, to exploit internalization advantages (vertical integration) but he contributed by saying that an international firm has the ability to exploit geographical advantages (by producing abroad, certain costs such as transportation and duties could be avoided). Coase's theory of the firm, does not take into account the fact that in order for a firm to exploit knowledge beyond its managerial possibilities and beyond domestic frontiers, a new kind of organization is needed (the need of the firms expansion due to diminishing returns to management). Therefore, diminishing returns to management create a need for the expansion of the firm; as a consequence, the firm could become multinational, increasing its market power by internalizing the steps of its production process (given by a vertical integration), and protecting its competitive advantages. This "need" for expansion is the linkage between the transaction cost approach (Coase, 1937) and the eclectic theory of the MNE by Dunning (1977).

Overall, the theories related to the MNE have evolved around two main topics, the ownership and protection of knowledge, and the need of MNEs to exploit host country advantages (expansion). The link between these theories and our objectives is the existence of knowledge. The battle between the domestic firms attempts to obtain MNEs knowledge, versus the attempts by MNEs to protect it and use it to exploit domestic advantages. At the end, the ability of exploiting knowledge (by either side) is what will determine the effects of FDI on trade (complementary or substitute effect). Productivity growth will also be achieved by the host country if it manages to incorporate some foreign knowledge into their industry (combined with domestic technology) or if the host country becomes self sufficient in technology innovations. Meanwhile, the MNEs

ability to protect its proprietary knowledge will be based on the choice of entry mode, as well as on the host country specific characteristics (determinants of FDI) which will trigger the MNEs interest to invest abroad.

The description of several theories related to the origin of the firm, the evolution of trade and, the theories of the MNE had the main purpose of providing a solid theoretical background of the origin of this thesis objective. The objectives have their origin in the protection of competitive advantages by MNEs, which is approached by Dunning's eclectic theory of the MNE.

2.5.3 Welfare implications of FDI:

FDI implies the inflow of capital into a nation's economic sector, it is expected that new investment will trigger production and efficiency; however empirical work does not always support this argument (Feinberg, 2001). Foreign direct investment may have the following effects on host economies:

- Technology innovation or transfer in home and host countries.- This might be the main purpose behind host economies making great efforts to attract foreign capital, however based on FDI theories and studies, MNE's are not always willing to share their "knowledge" because it would mean losing an important competitive advantage over domestic firms (Vaughan, 1995).
- Increase in research and development activities in some host countries. - MNE's often perform a great percentage of R&D activities in the home country, however the presence of international competition drives domestic industries to invest in technology and R&D activities in order to compete against new firms, however the availability of licenses sometimes discourages domestic R&D activities (Dijk, 1998) because of the ease to buy knowledge instead of generating it. The relation of this issue to FDI is that eventually, the domestic industry would create a dependence on foreign technology clearly affecting the potential of domestic productivity growth.
- Substitution of intermediate product trade for final product trade. - Werner and Wilkinson (1996) support the argument that one of the reasons why MNE's invest in developing countries is to have access to lower price sources of raw material which they would process and then export to serve a different market.
- FDI might increase demand for labor in the host country. - The effect of FDI on labor in the host country is ambiguous, Houck (1992) argues that poorly developed industries usually

have to shut down after being unable to compete against MNE's, so the impact of FDI on labor is minimal and is based mainly on a transfer of labor resources between industries. Gaston and Nelson (2001) suggest that FDI favors the use of skilled labor and usually increases the inequality in earnings for domestic employees. They also suggest that FDI favors migration of unskilled labor to places where unskilled labor is a scarce resource.

- Increase in the host country real income and consumption (due to an increase in real income).- Inward FDI sometimes implies the construction of new facilities, the employment of qualified labor, tax payments, higher wages and benefits. These factors contribute to higher consumption and real income.
- FDI sometimes causes an increase or decrease in exports/imports from host country. The literature recognizes two "kinds" of investment, the one that is market seeking and the one that is resource seeking. It is said that market-seeking FDI usually increases imports to the host country while resource-seeking FDI increases exports from the host country (Fontagne, 1999).
- Non-uniform distribution of benefits from trade (some damage could be caused to domestic industries). - Houck (1992) refers to the concept of specialization, the author suggests that when countries engage in trade, they tend to produce increasing amount of goods for which they have competitive advantages and tend to decrease production of less competitive industries, those decreases in production would be expected to be supplied by trade.

2.6 Summary

By recognizing that organizations do not allocate resources based solely on market mechanisms and by giving the entrepreneur his real value as a key element in firm growth, the transaction costs approach explains the basis for actual trends in international transactions. An important contribution of this approach is the concept of "diminishing returns to management" in which Coase (1937) explains that diminishing returns to management is the reason why the entire production could not be carried out by a single large firm, this concept set the basis for the theory of the multinational enterprise. Coase (1937) explained the motives for an internal managerial organization in a firm, these motives were based on the idea that some expenses could be avoided when an "entrepreneur" is in charged of allocating resources internally in order to make production more efficient". The theory of the MNE is mainly based on the exploitation of

knowledge (Casson, 1987), and in order for a firm to exploit knowledge beyond its managerial possibilities and beyond domestic frontiers a new kind of organization that was not explained by Coase emerged. The theory of the MNE was developed by Hymer in 1960, in his theory he explained the reasons why multinationals were able to compete successfully against domestic firms, he explained that this success was based on proprietary knowledge owned by multinationals as well as the development of new schemes to perform international trade that would allow MNE's to access foreign markets without spreading their competitive advantages to competitors. McManus (1972), performed an extension of Hymer's (1960) dissertation. McManus (1972) stated that firms perform international activities (joint venturing) in order to avoid costs associated with market knowledge, uncertainty and opportunism. Then Hymer's and McManus dissertations lead us to the discussion about different ways to perform international transactions, as discussed before, other alternatives than exports have emerged; FDI, licensing, franchising and joint venturing, the reasons why a firms chooses any of these alternatives to penetrate a new market are variable (as will be discussed later) however the degree of control of foreign operations, risk and profits among other characteristics of the target market are the reasons why firms choose a specific entry mode. It is observed that fully owned subsidiaries represent more risk for the investing company how ever it gives the investors full control and a greater margin of profits (or losses), joint venturing is considered a risk sharing operation in which the multinational can still have control over operations and lower risk by sharing some profits with a domestic firm, while franchising and licensing is considered only after exports the least risky way to supply a foreign market.

In this summary we can observe the fact that the internal organization of the firm (transaction cost approach) is not enough to explain the actual patterns of trade, however, the evolution of this approach to the eclectic theory of the MNE (Dunning, 1977) set the basis for explaining today's trends in international activity. There are years in between the origin of the transaction cost approach and the actual ways to trade, but overall "costs" and the protection of competitive advantages are the reason that determine the decision of a MNE on entering a new market and the most efficient way to do it.

2.7 Empirical observations on the international behavior of firms

FDI involves different ways to perform international transactions. The fact that governments are eagerly making important efforts to attract foreign capital to their domestic industries and that

there are "benefits" attributable to FDI are in a general sense the reasons for this research. Canada is a major inward FDI attractor in the world, but is FDI of real benefit for Canadian industry? Specifically is inward FDI of benefit for the Canadian agri-food sector? The following discussion is intended to look at some empirical work to provide us with answers to these questions and to set a framework for this research.

2.8 Effect of foreign direct investment on export performance.

Globalization is a force for which the benefits or costs to domestic industries are still debated. It is a fact that trade has positive effects on development and welfare even though the gap between rich and poor might be widening. Alternative strategies to trade may bring foreign technology and knowledge to less developed countries and industries (by licensing, franchising and even maybe through FDI), to some extent they are creating employment, increasing real income, but mainly globalization is motivating economies to allocate resources more efficiently. FDI is perceived by host countries as an "efficient" way to "import" knowledge and capital that to some extent is expected to create additional benefits for local industries and population; on the other hand foreign investors look at FDI as a way to exploit proprietary knowledge to penetrate new markets, to gain location advantages or as a way of having a cheaper source of inputs (labor and raw materials among others) that will allow them to sell their product or service at a competitive price in the international market. Both points of view have motivated questions about the real benefits of inward FDI.

The relationship between inward and outward FDI and export performance of a host country can vary across different regional, social and economic settings. Export promotion through FDI has been a motivation for governments to attract FDI, it is often believed that host countries may expand exports since multinational corporations are expected to bring into the host market new technologies increasing domestic competitiveness. Multinationals are also expected to have wider marketing networks that could be of benefit to the domestic export industries. Linkages that arise from the relationship between foreign and domestic firms also generate benefits; when export oriented foreign subsidiaries increase their purchasing of inputs from local firms, as the subsidiary succeeds and growth the host country trade of balance can also improve therefore under this scheme FDI and exports act as complements (Zhang, and Song, 2000). Fontagne (1999) described the effects of FDI from the "investor country perspective", he affirmed that FDI

could be seen as a substitute for trade as exports are replaced by local sales on foreign markets resulting in a damage to the investing country domestic industry in terms of production and employment. However he also mentioned that FDI and trade can also be seen as complements since investing abroad leads to greater competitiveness in foreign markets and trade of inputs, therefore this complementary relationship is of benefit to exports for the investing country. From a "host country" perspective, sales by foreign affiliates act as a substitute for imports from the investing country, however if inward FDI results in the importation of inputs this could have a negative effect on a host country's balance of trade. Leichenko and Erickson (1997) examined the relationship between manufacturing export performance and foreign direct investment in manufacturing industries across the U.S. Their findings were of a complementary effect of FDI on state export performance. Sun (2001) examined the impact of FDI on export performance across three macro-regions in China. Sun (2001) findings suggest a positive association between FDI and export performance, although for one region this effect was almost insignificant. In a similar study performed at a provincial level for China, Zhang and Song (2000) evaluated the role of inward FDI on export promotion for the provinces of China for the period 1986-1997. Findings were of a complementary effect of FDI on exports for the Chinese manufacturing industry.

Based on empirical research by Brouthers et. al.(1995) and given that Canada is an advanced industrial nation, it might be expected that inward FDI to the Canadian agri-food sector might tend to increase imports caused by intra-firm trade between the parent company and its subsidiaries. This could potentially negatively affect the Canadian balance of trade. Brouthers et.al. (1995), analyzed different countries trade balances. Countries were classified as advanced industrial nations (AINs) or developing countries (DCs), their findings suggest that relationships between FDI inflow and trade balances are moderated by whether a country is an AIN or a DC. Only the interaction between FDI and country type was found to be statistically significant. However Leichenko and Erickson (1997) have suggested only a complementary effect of FDI on the balance of trade. Pain and Wakelin (1998), as well as Hejazi and Safarian (2001) offer a different approach to evaluate the complementary or substitutability effect of FDI on exports. Pain and Wakelin (1998) evaluated the relationship between the location of production and trade performance of 11 OECD countries and their findings suggest that outward FDI has generally a negative impact on trade shares while inward FDI has generally a positive impact on trade shares.

Table 2-1 Literature review: Effects of FDI on trade performance

Research title/Author & date	Research topic and methodology	Findings
***Promoting exports, the role of inward FDI in China.** *Zhang, K. and Song, S. (2000)	*To examine the relationship between export performance and FDI flows for the manufacturing industry across provinces of China (1986-1997). *Modeled export levels as a function of FDI, domestic investment, GDP growth, share of manufacturing output of GDP & exchange rate.	* Their findings support the fact that increased levels of FDI positively affects provincial manufacturing export performance.
***FDI and regional export performance in China** *Sun, H. (2001)	*Examined the impact of FDI on export performance across three macro-regions in China. *Modeled exports as a function of FDI, domestic investment and % change of province trade.	* The author found evidence that FDI has a "trade creating" effect and that it also contributes to the rapid growth of exports in China.
***FDI and state export performance** *Leichenko, R. and Erickson, R. (1997)	*To asses the effects of FDI on the manufacturing export performance of US states (1980-1991). * Modeled exports as a function of FDI, exports, capital investment and exchange rate.	*Findings were that increased levels of FDI were positively related to improvements in state manufacturing export performance.
***Export performance and the role of FDI.** *Pain, N. and Wakelin, K. (1998)	*To evaluate the relationship between the location of production and trade performance of 11 OECD countries. *Using an export demand model, they modeled exports as a function of relative prices, market size and measures of relative innovation (with indicators of inward or outward FDI).	*The findings were that outward FDI had generally a negative impact on trade shares while inward FDI has generally a positive impact on trade shares.
***The aggregate impact of firms FDI strategies on the trade balances of host countries.** *Brouthers, L., Werner, S. and Wilkinson, T. (1995)	*They explore the reasons why firms decide to invest in advanced industrial nations or in developing countries. *The authors used a contingency framework outlining the conditions under which FDI inflows were related to trade surpluses of deficits. Trade balance, change in exports and change in imports were modeled as a function of FDI, a national dummy variable (AIN or DC) and an interaction variable.	*Their findings suggest that relationships between FDI inflow and trade balance is "moderated" by whether a country is an advanced industrial nation or a developing country. Only the interaction between FDI and country type was found to be statistically significant.
***The complementarity between US FDI stock and trade.** *Hejazi, W. and Safarian, E. (2001)	*The authors established the complementarity between FDI and trade. *The authors used a gravity model and trade and FDI data on bilateral basis between US and 51 other countries.	*Outward FDI was found to have a positive impact on US exports and greater than inward FDI. *Inward FDI was found to have a positive impact on US imports and greater than outward FDI.
***FDI and international trade: Complements or substitutes.** *Fontagne, L. (1999) (OECD working paper)	*To evaluate the relation between FDI and trade among 14 OECD countries.	*Outward FDI stimulates export growth from the investing countries supporting the idea of complementarity between FDI and trade. *The complementarity or substitution effect between FDI and trade can differ among countries.

Hejazi's and Safarian's (2001) findings suggest the opposite by proving the complementary of FDI and trade in the U.S. industry. Hejazi's and Safarian's (2001) findings suggests that outward FDI has a positive impact on U.S. exports while inward FDI has a positive impact on U.S. imports. The literature also suggest that inward FDI promotes intra-firm trade (Froot, 1993) however it also suggests that depending on the orientation of FDI home country exports could increase if FDI is resource seeking or decrease if FDI is market seeking (Fontagne, 1999).

2.8.1.1 Is there necessarily a positive impact of FDI on industrial sector performance?

The effects of FDI in host economies and industries have been widely studied from different view points, scholars have studied the effects of FDI on labor productivity and TFP, the effects of FDI on export performance, and they have also looked at the determinants and at the different entry modes of FDI into foreign markets. These studies have targeted entire industries and some sub industries as the objective of their studies; the process of globalization is closely linked with the existence of monopolies (on knowledge) or oligopolies (on markets), which in some economies represent an important participation of the market for a specific industry. The comparison can be illustrated under two scenarios:

The first one is an industry integrated by 100 firms of similar sizes, productivity levels, and export shares. If a foreign firm acquires one of those companies it is unlikely that FDI would cause a significant change in the overall industrial exports and productivity levels. However if the foreign firm acquires a significant share of all firms there would be a high probability of affecting the overall industrial productivity levels as well as the industrial export performance. Literature suggests that FDI usually increases productivity levels; however the positive impact on productivity could be from two sources, the first one caused by integrating new technologies into the production process, and the second one as a reaction of domestic firms to be able to compete against MNEs.

The second scenario could be an industry that is controlled by an oligopoly of three firms with similar productivity levels and export shares. If a foreign firm acquires one of them would there be any significant impact of FDI on productivity levels and export performance? If this is the scenario, should we imply that the impact of FDI on this group of firms would follow the patterns showed by studies which targeted entire economies and/or industries?. Probably not, if we consider that proprietary knowledge and other decisions that are the source of the MNEs increased competitiveness belong and depend strictly on the interests of MNEs that by using their ownership advantages, locational assets and managerial abilities seek increasing levels of market share and revenues. The previous discussion is based on Dunning's eclectic theory of the MNE. MNEs could then be considered as entities that are constantly looking at maximization of their investment and increasing their market share by the exploitation of their ownership advantages. Dunning (1998) states that MNEs take advantage of specific country economic characteristics (like impediments to international trade and investment) to decide about investing in locational assets including proprietary knowledge, which should be available to their affiliates according to

the best interest of the parent firm. Dunning (1998) emphasized the ability of MNEs to undertake their own management and production decisions by stating that specific demand characteristics of a country provides the foreign affiliates with the opportunity of producing differentiated goods which could be traded to the home country (intra-industry trade). In this statement, Dunning recognizes the existence of firm specific attributes to produce and market their goods according to their specific needs. Then, if FDI takes place based on individual firm's decisions, what is the link between the effects of FDI on specific firms versus national industrial sectors where most of the literature is concentrated? A suggestion could be that the transfer of resources and knowledge between countries by MNEs is dependent on the host country macroeconomic attractiveness or trade constraints, which directly influence the decisions of MNEs to risk their capital and specific advantages in a foreign economy.

Therefore the literature suggests that in addition to their competitive advantages, the sources of competitiveness of MNEs are industry specific or country specific and those MNEs have the ability to decide the best way to exploit them in order to achieve their goals. Given this case, then the way FDI impacts a specific sector should not be generalized to an industry level. Again, MNEs will decide whether to increase or decrease exports given specific market conditions and given their specific goals. Based on this argument the studies, which intend to study the impact of FDI on trade balances, should consider MNEs specific characteristic and objectives to determine if the presence and impact of FDI might have a positive or negative effect on an aggregated industry or economy. It will be our task to evaluate the effect if FDI has any impact on the Canadian agri-food industry and on specific sub industries such as the Canadian grain handling and dairy industries which currently have an important share of foreign control and which markets are being controlled by a decreasing number of firms.

2.8.2 Determinants of multinational enterprises entry mode

Why do foreign investors choose a specific entry mode when investing in a new market?

Previously we have discussed the fact that the theories of the firm (Coase, 1937) and the eclectic theory of the MNE (Dunning, 1977) are the origin of this research. The argument of the firm's resource allocation by an entrepreneur, and diminishing returns to management (Coase, 1937) provides the basis to justify the existence and growth of a firm up to a certain level. This approach failed to visualize the firm's need to expand beyond "one roof". It is Hymer's (1960) theory of the MNE that finally visualizes this need of expansion after the costs of additional

transactions of a single firm are equal to the costs at the open market. Later, Dunning (1977) argued that a firm expansion beyond borders is only feasible if they posses unique competitive advantages, in addition to the geographic advantage that would be provided by the host country, and if there were opportunities to be exploit in the host economy (internalization of the production process). The evolution of these theories suggest that MNEs will only invest abroad if there is a way to protect their competitive advantages, if the costs of operating abroad are offset by exploiting domestic advantages and locational advantages, and mainly if they can protect their competitive advantages from spilling to their competitors (domestic firms). The choice of entry mode is an important part of the multinational strategy, after the firm takes the decision on which market to enter and what product or service to produce, the next step is to decide the best mode for penetrating the foreign market; as discussed before, firms can enter new markets in the form of green field investment, acquisition, joint ventures among others and this decision is of main strategic consequences for the investing firms. The protection of proprietary knowledge by MNEs imposes a challenge for the host country to obtain technological spillovers from foreign firms. If MNE's were interested in spreading their advantages overseas to third parties, it is unlikely that they would do it through FDI (mergers and acquisition or greenfield investment). They would rather engage in franchise or licensing agreements.

Literature has identified different factors that affect the MNEs decision on the choice of entry mode. Casson (1985) mentions transaction costs as the major determinant of multinationals entry mode into a new foreign market, Sun (1999) defined entry modes as the forms of capital participation in international enterprises, and he also mentioned that in terms of property rights, entry mode is the ownership structure of a foreign subsidiary. Sun (1999) studied the entry modes of MNEs into China from socioeconomic perspectives; the author examined the impact of socio-cultural differences, the technology intensity of investment projects and regional factors affecting the MNE's entry mode choice. His findings suggest that cultural proximity positively influence the presence of wholly owned foreign enterprises, there is also evidence that the higher the technology involved in the project, the higher foreign equity share is present in the operations.

Root (1994) affirms that firms can enter international markets in different ways including exports, licensing and FDI depending on when firms decide to undertake FDI they face two basic decisions:

- Whether to own all or just a fraction of the investment
- Whether to set up a greenfield investment or to acquire an existing firm

Full ownership can be achieved by greenfield investment or through acquisitions while partial ownership (joint ventures) is reached by pooling assets of two or more firms in a common organization.

The literature identifies several factors that affect MNEs decision on how to enter a new foreign market, among these factors the theory of transaction costs seems to be the base of the final decision, socio cultural differences, technology of investment projects and policies and business environment are among the principal factors:

- Socio-cultural differences- Among the international community wide differences among countries exist; these differences are not an exception between home and host countries. (Kogut and Singh, 1988; Sun 1999) mentions that based on the transaction cost framework, the greater the socio-cultural differences among countries, the lower the degree of equity participation a multinational should own due to higher information costs that multinationals have to invest due to the unfamiliar cultural environment and the local "way" of doing business. Socio-cultural business are not a one side disadvantage, multinationals could find this "aggressive environment" difficult for transfering technology or managerial skills to host country workers in their subsidiaries, which means an important disadvantage for the host economy. These difficulties can be avoided by joint venturing with local firms lowering capital risk and even with the possibility for the investing firm of appropriating new skills and knowledge from the host country (and vis a versa). Kogut and Singh (1988) conducted a similar study as Sun (1999) using a logit model to investigate if national culture influences the choice of entry mode by MNEs, their findings also supported Sun's (1999) results suggesting that closer cultural distances influence the choice of entry mode by demanding higher shares in the operation. However literature on Japanese FDI entry mode (Siripaisalpipat and Hoshino, 1999) suggest that some firms react to socio-cultural and technical differences by demanding greater percentage of ownership in order to impose their own operating methods. By evaluating Japanese firms established in Thailand, the authors made a comparison between greenfield investment and joint ventures, the objective was to evaluate if firms specific advantages and the entry mode of MNE's determined the performance of their subsidiaries. Their findings suggest that when parents firms possess firm specific advantages greenfield subsidiaries performed better than joint ventures.
- Research and development intensity.- Proprietary knowledge is a highly specialized asset, it is usually the main foreign firm competitive advantage and affects directly the multinational

decision of entering a new market. (Casson, 1985; Buckley and Casson, 1996) suggested that the proprietary nature of a product process and the amount of marketing expertise that firms possess are factors that affect the decision of ownership percentage. (Anderson and Gatignon, 1986; Sun, 1996) suggest that firms seek to have more control as the technological content of a product increases, then it is expected that a foreign investing firm will have a greater propensity to joint venture with local firms if certain degree of technological development exists, how ever it could be expected by the host country with "significant" proprietary assets to have less incentive to joint venture with foreign investors.

- Host country policies- In any international operation uncertainty (country risk) is an important determinant of pushing or pulling foreign capital into or from a nation. Country risk can originate from various sources, social and political instability, an ambiguous legal system, foreign exchange controls and nationalization threat. It is expected that in a highly unpredictable environment, multinationals tend to limit or avoid investment and if investment takes place, multinationals will try to have the highest control possible in order to compensate for risk (Anderson and Gatignon, 1986). Host country economic conditions and policies also affect the decision to invest, the economic growth trend and market size are important factors for foreign investors, especially those who are market seeking investors. Domestic policies influence the structure of foreign subsidiaries; it is common for countries interested in attracting foreign capital to promote favorable tax policies in order to encourage foreign subsidiaries to settle in their territory.

The chosen entry mode by multinationals then is directly related to the protection of their competitive advantages and risk, the spread of knowledge arises as an important consideration for multinationals to decide if having full or partial control in a foreign operation is necessary. By protecting their competitive advantages and exploiting host country advantages, they guarantee their ability to compete against host country firms. Under the previous consideration, MNEs could entera new market by acquiring an existing firm or by greenfield investing if they want to have full control of the operation and tangible and intangible assets; however these entry modes often imply higher risks of operating abroad for the parent company. By joint venturing, MNEs decrease the risk of operating abroad given the "support" they get from their host country partners, however full control of tangible and intangible assets is not guaranteed.

2.8.3 Spillover effects of FDI on host economies.

One of the main objectives of this research is to evaluate whether or not there are FDI productivity spillovers in the Canadian agri-food industry. The concept of productivity should be defined and linked to the different international firm strategies in order to discuss the spillover effect of each of them on host economies and to look at the importance of FDI as one of the "most efficient" strategies to trade and to transfer technology.

Table 2-2 Literature review: The MNE's choice of entry mode

Research title/Author & date	Research topic and methodology	Findings
***Entry modes of MNEs into China's market** *Sun, H. (1999)	*Examined the effects of cultural, technological intensities, investments and regional factors, to determine what issues affects MNEs decision in the entry mode.	*Joint ventures (jv) minimize business uncertainty for foreign investors. *JV's were found to be an efficient mechanism to transfer technology to domestic firms.
***The effect of national culture on the choice of entry mode** *Kogut, B. and Singh, H. (1988)	*Entry choice was modeled as a function of cultural characteristics, firm variables and industry variables.	*The effect of cultural distance and risk aversion increases the probability of choosing a joint venture (jv) over an acquisition.
***An economic model of international JV strategy.** *Buckley, P. and Casson, M. (1996)	*To explain the formation JV's in terms of market size, culture, protectionism influences and the choice by MNEs to penetrate a new market.	*Factors such as technological uncertainty, cultural distance and market size were discussed *No empirical analysis was performed
***Foreign market entry strategies.** **Buckley, P., and Casson, M. (1998)	*To evaluate the way location costs, financial variables, cultural factors, market structure and adaptation costs influence the strategy to enter a new foreign market.	*Firms with higher technology usually favors Greenfield production. *Higher costs of learning t encourages licensing, jv, franchising or acquisitions
***Modes entry: A transaction cost analysis and propositions** *Anderson, E., and Gatignon, H. (1986)	*Proposes that the most efficient entry mode is a function of trade off between control and the cost of resource commitment.	*Proposes circumstances under which each mode maximizes long-term efficiency based on the transaction cost approach. *No empirical analysis was performed
***Firm advantages, entry modes, and performance of Japanese FDI in Thailand.** *Siripaisalpipat, P., et. al. (2000.)	*The study is based on the hypothesis that firms specific advantages and the entry mode of MNE's determine the performance of their subsidiaries.	*Findings suggests that when parent firms possesses firm specific advantages Greenfield investment outperformed joint ventures.

2.8.3.1 Determinants of productivity:

Harris (1999) defined productivity as a "measure of how effectively the resources of an economy are translated into the production of good and services", higher productivity means that more goods and services can be derived from the same amount of factor inputs, therefore the importance of evaluating productivity is the relation that exists between a national living standard and real income with productivity growth".

There are basically two concepts of productivity:

- Partial factor productivity (PFP). Refers to productivity when it is expressed in terms of output per unit of single input. Output per unit of single input such as labor is a particular measure of

productivity because it does not account for the effects of additional factor inputs. Labor productivity measure is a good example of PFP, because higher output per unit of labor can be achieved by increasing the use of technology (machinery, fertilizers, etc.) (Harris, 1999).

- Total factor productivity (TFP). This concept emerged as a consequence of the inaccuracy of PFP as a productivity measure; TFP relates output to a combined set of two or more factor inputs (usually capital, labor and materials) and is intended to reflect the combination of all factor inputs. A change in TFP measures the change in output that can not be accounted for by the change in combined inputs, TFP is also defined as a measure of overall efficiency gains, it measures the ability of an economy to obtain increasing amounts of real output from a given level of all factor inputs capturing the effect of improved organization in the work place, enhanced skills of the labor force, new technologies and infrastructure. TFP growth is considered an important indicator of the rate at which an economy can provide its citizens with improved living standards. The importance of using TFP as a measure of growth is the fact that output growth does not depend entirely on a single factor of production, the law of diminishing returns implies that the incremental output from adding an additional unit of input will decrease at some point; therefore improving TFP is crucial for an economy in order to sustain long term economic growth (Harris, 1999).

In summary, the growth in total factor productivity refers to the change in output relative to the change in bundle of inputs measuring a residual growth by measuring the increase from the growth in production minus the increase of inputs used in the production process (if output in an specific industry grows 7% annually and inputs increase by 5% then TFP increases by 2%).

2.8.3.1.1 Indices

Rahuma (1989) stated that the literature looks at TFP as a measure of technical efficiency. Given that available TFP data is expressed in indices, it is important to introduce them. An index is an alternative to aggregate various outputs or inputs into an overall physical measure. In literature there are four major indexes used to aggregate several outputs and inputs, during this section these index number procedures will be described.

- **The Laspeyres Index**

  The Laspeyres quantity index can be written as:

  $$Q_l = \sum P_{i0} X_{i0} / \sum P_{i0} X_{i0}$$

  And the Laspeyres price index can be expressed in the following form:

$$q_t = \sum P_{it} X_{io} / \sum P_{io} X_{io}$$

Where Q_t is the aggregate output or input quantity index in period t, and P's and X's are prices and quantities of several outputs or inputs. The subscript zero is the base period and the subscript t is the comparison period, and the q_t is the output or input price index (Rahuma, 1989). Laspeyres index uses fixed year prices as weights in the aggregation process, this index only reflects the change in magnitude of total quantity of output or input resulting from quantity variations (because it does not captures the year to year price effect on aggregate quantity of inputs and outputs).

- **The Paasche Index**

The Paasche quantity index can be written as:

$$Q_t = \sum P_{it} X_{it} / \sum P_{it} X_{i0}$$

And the Paasche price indexindex can be expressed as:

$$q_t = \sum P_{it} X_{it} / \sum P_{i0} X_{it}$$

Where Q_t, q_t , P's and X's are defined as in the Laspeyres index. The difference between these two indexes is based on the fact that Laspeyres index uses a base year price as a weight while the Paasche index uses the end year price as a weight. Usually as a consequence of this difference the Paasche price quantity index is greater than the Laspayres price quantity index if prices and quantities tend to move in the same direction between years 0 and t; the Laspeyres index is the greater if prices and quantities tend to go in the opposite direction (Allen, 1975).

- **Fisher Ideal Index**

Allen (1975) described the Fisher index as a geometric mean between the Paasche and Laspeyres indexes. This index uses an average weight of both indexes in order to include the base and the comparison period. Therefore the problems of a biased estimation by the first to indexes can be minimized. The Fisher Ideal quantity index is specified as:

$$QI_{0t} = v\{Y_{0t}(P_0) Y_{0t}(P_t)\}$$

Where QI_{0t} is the Fisher ideal index and $Y_{0t}(P_0)$ and $Y_{0t}(P_t)$ are described as follows:

$Y_{0t}(P_0) = \sum P_0 X_1 / \sum P_0 X_0$ *(Laspeyres quantity index)*

$Y_{0t}(P_t) = \sum P_1 X_1 / \sum P_1 X_0$ *(Paasche quantity index)*

- **The Tornqvist Index**

Is also mentioned by Christensen (1975) as the divisa related index, it can be expressed as (Rahuma, 1989):

$$Q_{(t)} / Q_{(0)} = \exp\{\int[\sum W_{it}(X_{it} / X_{it})]\}$$

Where $W_{it} = P_{it} X_{it} / \sum P_{it} X_{it}$

W_{it} represents the share of the i-th factor in total cost or the share of the i-th output in total value product. P's and X's are the prices and quantities of inputs or outputs. This index utilizes the prices of both, the base and the comparison periods.

2.8.3.2 Benefits of increasing levels of productivity

Herbertsson and Zoega (2002) stated that in order to generate and foster steady state growth of output and consumption percapita large economies should offer greater incentives for innovations as this provides the potential innovator with a larger market innovation mainly occurs in imperfectly competitive industries and is also an important factor that determines entrepreneurial activities in an economy.

R&D activities are the main cause of innovation. Higher rates of innovation increase the standard of living and national economic growth. Innovation can occur everywhere and is usually reflected in lower prices, higher factor returns, greater output growth and greater profits. Given the benefits of the R&D on national economies, nations around the world are encouraging FDI. There are several effects of FDI on host economies however the search of new knowledge oriented to increase national productivity levels is one of the main reason why host economies promote inward FDI.

FDI has an important presence in the Canadian manufacturing sector, Tang and Rao (2001) stated that foreign controlled firms are responsible for generating more than half of the revenues from the Canadian manufacturing sector and about one third of the revenues in the Canadian economy. Tang and Rao (2001) also mention that MNE's in Canada are more efficient, create better paid jobs and account for over 40% of total expenditure in R&D in the Canadian manufacturing sector. Rao and Tang (2000) stated that foreign controlled firms do less R&D per unit of sales than Canadian controlled firms. The MNE's R&D propensity is smaller in the host country than Canadian firms because of differences in firm size and export orientation however its important to consider that most of the R&D performed by multinationals takes place in their host country because of the control and protection of the investment in R&D. Rao and Tang (2000) and (Teece

1977) support the fact that the comparative advantage of MNE's is based on technologies that are often developed in the home country, then exploited around the world, MNE's maximize the return to their R&D investments leaving R&D activities at host countries mainly as a means of adapting technologies developed abroad to domestic markets and regulations. Therefore it could be implied that given the size of MNE's firm, the expenditure on R&D performed at the home and host country, the R&D propensity could be higher than Canadian firms expenditure, this fact could explain the productivity gap that exists between domestic and foreign companies. We have to recall the transaction cost approach and the theory of the MNE, in which is implied that multinationals exist with the purpose of using abroad their intangible assets (technology), and that technology transfer via intra-firm trade costs less than "arms length" market alternatives (Teece, 1977).

2.8.3.3 Sources of productivity growth

Nieser (1996) stated that there are two main sources of productivity growth; the first one is related to technological innovation, which he considered as the stock of highly trained human capital, this human capital is the one that contributes through innovation to the production process. The second source is "the extent to which businesses have benefited from this increase in skill level in terms of making innovations".

Harris (1999), discussed what he considered the main determinants of productivity growth for the Canadian industry:

- **Education, training and human capital.** -Human capital can trigger productivity growth in two directions: The first one is by facilitating knowledge spillovers (by transmitting your skills to unskilled workers). The second one is by adapting new technologies through skilled workers (technology adoption).
- **Open borders to trade and investment.** - Warner (1995) found a linkage between "openness" (trade) and productivity growth; there are several arguments that intend to explain this linkage:
  - Low trade barriers.- By facilitating a better use of resources based on traditional comparative advantages.
  - Small countries benefit because "openness" allows the realization of scale economies which are not feasible if relied only in the domestic market
  - Openness facilitates diffusion of knowledge and technology abroad.

- Openness also implies greater exports (or imports) and there is evidence that exporters firms and multinationals achieve greater levels of productivity. (Aitken et. al 1999; Harris, 1999).

- **Investment in machinery and equipment.** - Countries not only rely on domestic R&D for new ideas, a great amount of information comes from abroad in the form of new equipment and scientific publications. Harris (1999) affirms that productivity growth is highly correlated with investment in machinery and equipment (measured as a share of GDP). By investing in machinery and equipment countries invest in new technology and innovative ideas contributing to productivity growth and avoiding high expenses on duplication of technology.
- **Innovation and technology diffusion.** - Literature identifies knowledge spillovers as an "engine for growth". Harris (1999) stated that "international diffusion of technology either via spillover or via explicit technology adoption figures prominently in any likely explanation of productivity change in Canada"
- **General purpose technologies (GPT).** - The development of this kind of technology can dramatically trigger productivity growth. GPT refers to a major innovation that could lead to a transformation of production and distribution processes (electrification, computer systems development, etc).
- **Resources reallocation.** - The growth process is facilitated by relocating resources from a low-productivity growth industry to a high productivity growth one instead of limiting the availability of resources and technologies.
- **Macroeconomic factors.** -
  - Aggregate demand. - A weak aggregate demand reduces output growth and therefore reduces productivity growth.
  - Unemployment. - A weak aggregate demand can also cause unemployment that is also reflected as the decrease in the generation of new skilled workers.
  - Recessions. - This downturn in an economy could be caused by obsolete technology and the re allocation of resources in more highly productive uses.

Scholars agree on the fact that productivity is the most important determinant of a nation's living standard (Niesser 1996 and Harris 1999), however the interest of keeping track of national levels of productivity "growth" is the fact that this growth is linked with increasing gains or the detriment of a nation's or industry welfare. As will be discussed in further detail during this chapter, empirical work has been done around the world evaluating the effect of foreign direct

investment R&D spillovers effect on productivity growth (Hanel 2000, Blomstrom & Sjoholm 1999, Haddad & Harrison 1992, Globerman 1979), however the R&D spillover effect has not been found to be consistent among countries and industries implying the need of evaluating if the presence of foreign capital in the Canadian industry has a positive contribution to productivity growth for every specific industry. This kind of analysis could contribute to redirect policies or to better reallocate domestic resources of industries that could be affected by globalization.

2.8.3.4 Does entry mode affect host country productivity?

So far we have discussed the considerations that firms faces in order to decide the entry mode for a new market. In the previous discussion authors agreed that the entry mode decision is related to control, risk and profits issues and that overall, after greenfield investment and acquisitions, joint venturing is the alternative that gives the investors the most control over foreign operations and profits in exchange for higher rates of risk as compared to alternatives such as licensing, franchising, and exporting. But these lines only reflect the investors point of view, every time international trade takes place there is an immediate effect on both of the traders; focusing on the effects of the different ways to trade on productivity or innovation. We have to ask if entry mode affects the host country productivity growth?, The answer is directly associated with specific characteristics of the industry under analysis, therefore the approach of this project is the evaluation of our objectives at a disaggregated industry level. The way entry mode affects the host country levels of productivity growth could be linked to: a) the degree of control of proprietary knowledge being exercised by the MNEs through entry mode, b) The degree of industry concentration. If the MNE enters a new market by acquiring an existing firm chances are that technological spillovers would be limited (if compared to a J.V. agreement), however an increase in productivity growth could be triggered by the "new" competition in the host country represented by the MNE. The level of industry concentration could also have some impact in the host country productivity growth levels, given that if the industry share of foreign control is greater than the domestic share, R&D investment by domestic firms could be expected to decrease proportionally to the increase of foreign ownership control. Then, if most of the R&D in the host country turns to be done by MNEs which have chosen to enter a market by acquisition or greenfield investment (which provides them with full control of tangible and intangible assets), the R&D spillovers to domestic firms should not be expected to be generous, therefore affecting the host country productivity growth levels.

So far literature has not identified a relationship between MNEs entry mode and the effect of FDI on trade (as a complement or substitute). As we have discussed in previous sections, literature does have identified relations between the MNEs business objective and trade. These relations refer to FDI acting as a complement for trade if its objective is to be resource seeking (internalization of a specific process or product needed as a part of a vertical integration), and could increase imports if the foreign investors target is to be market seeking (which would imply higher imports into the host country). The objective of this research is not centered on identifying entry mode relations to trade; this issue could be a recommendation for further studies. Our objective is based on proving that MNEs choice of entry mode in the Canadian agri-food industry is being influenced by the MNEs protection of proprietary knowledge as suggested by the theory of the firm. Should this analysis have a positive outcome it would imply the need to identify the reasons behind Canada's agri-food industry promotion of FDI.

Looking at joint ventures, they are seen by foreign investors as an attractive way to enter a market, joint ventures give investors the ability to exert control over foreign operations, decrease the risk of investing in an unknown market and have an important share of profits generated by the operation. The spillover benefits of innovation for the host country generated by the presence of foreign capital in host industries has been widely studied (as will be discussed in further detail in the following section) but scholars are still uncertain of the benefits for host economies. Some authors such as Aitken and Harrison (1999), Haddad (1993) and Feinberg (2001) did not find evidence of technology spillovers for domestic firms generated by joint venture activities; they concluded that the benefits were fully captured by the joint ventures or foreign affiliates. Other authors such as Hanel (2000) and Caves (1974) did find direct or indirect productivity spillovers on host country industries.

Licensing and franchising are both efficient ways to serve foreign markets, both systems involves the "use under contract" of proprietary knowledge (to provide a service or/and to elaborate a product), the main difference is the fact that franchising is an "organizational form" that allows the franchisor the decentralization of operations, the benefits of this system are the facts that the franchisee is the one who invest their capital to exploit an existent knowledge in exchange for "residual claims" instead of a salary (Michael, 2000), with this kind of transaction it is expected that the franchisee will be more engaged with the success of the business than a regular employee because he is the one who is risking the initial capital. Then, is there any technological or innovative spillover effect of franchises or licenses for the host country? Overall it would be

expected that the person involved in the operation of this "knowledge under contract", will gain skills and of course knowledge that could easily be applied if the workers migrate to a different company, however with respect to technological or innovative process spillovers, previous studies (Dijk, 1998) suggest that the ease of paying for knowledge (licensing) creates a replacement for R&D activities by the acquirer inducing to lower research rates; Michael (2000) in his study in which he compared the quality of services provided by franchises versus fully owned subsidiaries suggested that "franchises contracts decrease quality in decentralized service chains", both studies do not identify specific technological spillovers from these kinds of entry modes, Dijk, 1998) suggests that the entrepreneurs who acquire the franchise or license rights are not encouraged to perform further innovations other than the ones provided by the franchise or the licensor because of the restrictions of the license or franchise contracts, the author suggests that an alternative way to encourage innovation by both sides is to have "special exchange clause" that could allow any improvement to be incorporated in the process of exchange for lower franchise or licensing costs.

Large amounts of research have also been done relating exports to productivity growth, the hypothesis of "export led growth" sees the growth of export as "triggering" effect on an economy in the form of technological spillovers (Marin, 1992). The export-led growth hypothesis predicts that the rate of export growth will cause economy-wide productivity gains. There are several assumptions that give this theory its strength:

- The fact that exports are seen to concentrate investment in the most efficient economic sectors increases productivity.
- Export growth allows the exporting country to gain from economies of scale (larger operations are done internationally than by supplying only the domestic market)
- Exports exposes domestic firms to foreign competition, therefore exporting industries have to innovate to produce at a competitive price and quality (technological change).

Previous empirical work has not found consistent evidence to fully support this theory, Kunst and Marin (1989) performed a causal analysis to evaluate the relationship between exports and productivity growth based on Austrian data, the authors did not find a causal link that suggest that exports increases productivity, however they found a positive causation from productivity to exports. Marin (1992) performed similar research using data from U.S., Japan, the U.K. and Germany; her findings suggest that for these countries exports causes productivity growth. Both studies evaluate the productivity "benefits" generated by exports only for the exporting country

not for the host economy, however, Aguilar (2002) in his comments about the effect of NAFTA on Mexican agriculture, suggest that the elimination of import barriers has had a damaging effect for an important part of the Mexican agricultural sector where only a few producers were able to compete against the entrance of lower cost agricultural commodities. Overall the productivity benefits (if they exist) seems to be fully captured by the exporting country, the indirect effect on productivity in host countries that exports could have is by increasing competition in the host countries.

In summary, the way trade is performed does have immediate effects in the host economy, benefits are of a wide variety (higher wages, lower prices to consumers, changes in productivity, etc.), however technological or innovation spillovers are not always generated for the host country; overall, it seems that joint venturing is the alternative that can better influence or "spill" technological benefits to the domestic industries. Home countries productivity levels encourage market seeking foreign direct investment, however home country productivity levels are not a main determinant for resource seeking FDI. The uncertainty caused by cultural, political and economic factors seems to be the main determinant of deciding the mode of entry to a new market.

2.8.3.5 Foreign direct investment determinants and spillover effects on host economies

As discussed previously, the "search" for knowledge is one of the main reasons that drive host economies to make important efforts to attract FDI; while on the investor side the exploitation of intangible assets such as knowledge provides them with a great advantage in efficiently competing against domestic firms in a foreign market. New knowledge is expected to generate higher levels of productivity, therefore the main objective of this research is to evaluate FDI spillovers on the Canadian agri-food sector.

Given the importance of FDI on international trade and the efforts of nations to attract FDI several attempts has been made to evaluate the effects of FDI on domestic economies, however this only involves discussion of the effects on host economies without looking at the drivers of foreign investors to "risk" their capital in a foreign country; then, two parallel questions arises: What drives foreign direct investors to invest in a foreign country? And what are the spillover effects on host economies?

FDI is based on activities of foreign multinationals operating across borders, literature related to the determinants of FDI indicate that multinational firms allocate their capital among countries in

order to maximize their risk-adjusted profit (Caves, 1996). Zhang and Felmingham (2001) affirmed that multinationals source of profits are generated by three main factors:

1. Factors within the firm that enable the firm to grow and diversify better than others at home or abroad (knowledge on a specific field).
2. Factors in the host country that make the country the best location for a multinational to invest in and generate profits (cheap labor, tax incentives, market size, etc.).
3. Factors associated with the firm trade off between FDI and exporting or licensing (transaction costs).

Using a cross-sectional analysis and panel data, Zhang (2001) evaluated the effects of location characteristics and government policies on FDI flows in China (1987-1998).

Findings suggest that China's market size, infrastructure and liberalized regime are highly attractive to foreign investors. Overall an "agreement" seems to exist among researchers on the main "attractors" of inward FDI; factors such as market size, labor costs, labor quality, agglomeration economies, transportation costs, culture, and degree of economic openness among others are considered common inward FDI attractors (Walkenhorst, 2001; Zhang, 2001; Annand and Kogut, 1997). Walkenhorst (2001) developed a model to analyze cumulative FDI inflows into Poland's food industry during the 1990's. Findings also support the fact that trade liberalization, labor costs as well as geographical distance are important determinants in attracting inward FDI. In a similar study, Walkenhorst (2001) developed a statistical model to analyze the determinants of FDI in the Polish food industry. Using data from three investor home country clusters is related to characteristics of 12 food industry branches. Findings suggest that firm size, privatization speed, value added and import share are important attractors of inward FDI for the Polish food industry. Using U.S. commerce data, Anand and Kogut (1997) evaluated the technological motivations that drive foreign firms to invest in U.S. The dependent variable used in the model was FDI made by a specific country; the independent variables were intended to measure:

Technological capabilities and rivalry.- The authors relied on R&D expenditure data from the investing country. In order to measure technological intensity and rivalry they subtracted foreign R&D expenditure from U.S. R&D expenditure, understanding that if the obtained coefficient has a positive sign, then it would be implied that U.S. R&D intensity pulls FDI or in other words, FDI is motivated by technology sourcing reasons.

Market attractiveness- The authors used data on concentration rates and advertisement measures, value of shipments and imports. The analysis found evidence that technological industries are responsible for attracting an important share of FDI.

Table 2-3 Literature review: Determinants of FDI

Research title/Author & date	Research topic and methodology	Findings
*What attracts foreign multinational corporation to China? *Zhang, K. (2001)	*To evaluate the effects of location characteristics and government policies on FDI (1987-1998). *FDI was modeled as a function of market size, labor costs, labor quality, agglomeration effects, transportation costs, FDI incentives, cultural links and openness.	*Findings suggest that China's market size, liberalized FDI regime and infrastructure are attractive to FDI investors. *Regional distribution of FDI is influenced by FDI incentives and cultural links.
*Technological capabilities of countries, firm rivalry and FDI. * Anand, J. and Kogut, B. (1997)	*Authors attempt to identify if technology in the host country is a motivation for investment by several OECD countries multinationals in US. *FDI was modeled as a function of technological capabilities, rivalry and market attractiveness	*The authors found evidence that technological industries attract a "disproportionate" share of inward FDI. *They found evidence of industry rivalry as a determinant for FDI
*Determinants of FDI in the food industry: The case of Poland. *Walkenhorst, P. (2000)	*To analyze the main determinants of inward FDI in the Polish food industry. *Inward FDI was modeled as a function of firm size, privatization speed, labor intensity, value added, import share, and demand growth.	** The results suggested that firm size, privatization speed, value added and import share are important determinants for inward FDI in the Polish food industry.
*The geography of FDI in Poland's food industry. *Walkenhorst, P. (2001)	*Using data from 28 investor countries, a gravity model was used by the author in order to analyze cumulative FDI inflows into Poland's food industry. *FDI was modeled as a function of GDP, distance, trade, labor costs, capital costs, input costs, and sector size.	*Results suggested that there are evidence of positive links between FDI, trade and labor costs. *Geographical distance was found to be significant for the staple food industries but not for high value added production.
*The economics of FDI and trade with an application to the US food industry. *Gopinath, M. et.al. (1999)	Investigates the determinants of FDI and its relations to trade in the US food processing industry.	*Host country protection policies affect the decision to invest. *Evidence of substitution between FDI and exports was found.
*Locational determinants of Japanese FDI in China. *Zhou, Ch. et.al. (2002)	*To identify the role of policy on the decisions of Japanese firms to invest in China.	*Openness to trade and economy size were found to be significant attractors of Japanese FDI.
*The determinants of FDI in Australia. *Yih, J. et.al. (2000)	*Evaluated the main determinants of FDI inflows into Australia.	*Openness to trade, interest rates, labor costs were found as important FDI determinants.
*The location of FDI: An empirical analysis *Billington, N. (1999)	*To determine what influences the decision to invest in specific regions in seven industrialized countries.	*Corporate taxes and interest rates significantly affected MNEs location decision.

In summary, authors seem to have reached similar results when determining the main attractors of FDI. They are:

- Market size is considered an important factor affecting multinational revenues, particularly for FDI that is intended to gain access to local markets. The bigger the market size is the greatest FDI can take place.

- Labor costs are one of the main "attributes" that export oriented foreign investors look at when deciding where to invest particularly if the product being produced requires of a labor intensive production process.
- Transportation costs are considered one of the main FDI attractors, usually foreign investors require a well-developed transportation network that will facilitate product distribution and by lowering transportation costs multinationals can sale the product at a more competitive price.
- Openness an open economy usually has established rules that protect and provide certainty to foreign capitals (lower risk is perceived by foreign investors).
- Other factors such as inflation, interest rates firm size and location are also considered as important inward FDI determinants (Table 2-3).
- Labor quality, education impacts production in two ways: by raising output and by enabling firms to operate production with high technology.

Proprietary knowledge is the main specific advantage of multinationals when establishing in a new foreign market, knowledge allows multinationals to better compete against domestic firms which have a better understanding of the local market and preferences. The entrance of multinationals in "new" open markets can have a disturbing effect on traditional domestic enterprises. These disturbances are caused by externalities derived by multinationals (spillovers) which can be of benefitial or damaging for the domestic industry. The spillover effects derived by the intervention of multinationals are the result of an increase in competition for a common market, the spillover effect on host economies is a current concern of domestic industries; this concern has motivated several attempts to evaluate the beneficial or damaging effects of FDI.

Technology seems to be the main driver (competitive advantage) for foreign investors to invest in a new market, however technology is also the main motivation for host countries to promote inward FDI; host countries engage in FDI expecting to improve on productivity and to acquire new knowledge in the form of technology or managerial and marketing skills which should help the local industry to narrow the competitiveness gap with other countries. R&D expenditures or R&D stock, intra-firm trade and sales by domestic and foreign firms are common variables used by scholars to evaluate technology spillover effects on domestic productivity growth (Hanel, 2000; Caves, 1974; Blomstrong and Sjoholm, 1999; Aitken and Harrison, 1999, Haddad, 1993). Similar studies and models have been used by other scholars to evaluate the spillovers effect on different nations manufacturing industry and specific industries (Caves, 1974; Blomstrong, 1999;

Aitken and Harrison, 1999, Haddad, 1993), the model used by these scholars differ basically in the way the explanatory variables are modeled, they also vary in the fact that some studies contain panel data, and that findings across countries and industries are not always consistent. It is common to find in literature that inward FDI can have positive or negative effects on specific domestic industries, authors have not been able to identify a specific trend that could allow them to better forecast the outcome of FDI, however there seems to be a "general consensus" in the fact that domestic R&D expenditure is often the main source of positive spillover effect for domestic industries while foreign R&D spillovers are usually limited to the joint venture partner or have lower significance among independent variables (Hanel, 2000).

2.8.3.6 Summary

FDI has different impacts in economies worldwide, other than the automatic benefit that countries obtain when foreign capital inflows are attracted by their economies (increase in federal reserves), there seem to be four major points of concern when evaluating FDI performance in home economies:

- The effect of inward FDI on national trade balances
- The optimal choice of entry into a new market
- What are the main attractors for foreign investors
- The spillover effect of FDI on host economies

Scholars have evaluated these implications and determinants of FDI around the world and across industries. When evaluating the effect of FDI on export performance, the most common finding is the fact that inward FDI has two purposes, to be market seeking or resource seeking; when FDI is market seeking it usually acts as a complement to export activities, when it is resource seeking it favors imports.

When evaluating the optimal choice of entry mode for foreign investors, several factors are evaluated; however three of them seem to be of main importance:

- Geographical distance
- Trade oriented government policies
- R&D intensities and property rights protections

Overall findings suggests that geographical proximity is directly related to de degree of ownership that MNE's demands in a domestic operation, cultural proximity favors higher degrees of ownership (Greenfield investment or acquisitions), while geographical and cultural distances

are perceived as higher risk favoring joint ventures, licensing or franchising agreements. Agglomeration economies also favors higher degrees of ownership, countries that are part of an economic free trade area are more susceptible to attract FDI. Through this chapter emphasis has been made on the fact that cost reduction and trade of knowledge are the main motives of FDI. Given that knowledge is a major competitive advantage, foreign investors need guarantees that their advantages will be secure when operating in a foreign country. Strong protection laws are perceived to decrease in risk and promote high levels of ownership.

The determinants to FDI affect directly production/marketing costs that are the incentives to invest abroad, these factors are:

- Market size
- Labor costs and labor quality.
- Transportation costs
- Openness and other factors such as inflation, interest rates firm size and location are also considered as important inward FDI determinants.

FDI spillovers evaluations are widely focused on the effects on labor productivity, wages and TFP growth. As discussed previously, TFP is an overall efficiency measure that captures the effects of a wide variety of inputs related to the production process, then given that this thesis will focus on evaluating FDI spillovers on TFP growth. By using R&D expenditures, Hanel's (2000) paper encloses the basis of the variables that authors have used to model technological spillovers in domestic economies.

2.8.3.7 Empirical work: FDI spillovers in Canada.

Investment on R&D activities is expected to generate innovative production processes that are expected to be more efficient; these new processes have a direct impact on society and industries, which at the end of the road usually increase nation's living standards. Bernstein (1988) stated that *"a major reason for the policy focus surrounding R&D activities is that there is a public good aspect to R&D capital accumulation"*. With this statement it is implied that any time R&D is performed, the benefits are not fully captured by the researcher or the institution there is expected to be certain degree of knowledge transfer among individuals, industries or even among nations which are called "R&D spillovers". Bernstein (1998) also stated *"international spillovers associated with R&D investment imply that national living standards are interdependent"*. Currently, nations involved in trade activities do not limit trade to product and services. During

this chapter, different methods of international transactions were described in which all of them included the protection or transferability of knowledge, implying that a country's stock of knowledge does not fully depend on their own R&D activity but on foreign countries R&D activities as well.

Table 2-4 Literature review: Technological spillover effects from FDI

Research title/Author & date	Research topic and methodology	Findings
*Are there positive spillovers from direct foreign investment? * Haddad, M. and Harrison, A. (1992)	*Using firm level data, the authors evaluated productivity spillovers derived from FDI to the Moroccan manufacturing industry. *The authors modeled productivity growth as a function of share of foreign assets in a domestic firm, share of foreign firms in the sector and firm size.	*The authors did not find evidence of increasing productivity levels derived from foreign presence in the manufacturing industry.
*Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. * Aitkken, B. and Harrison, A. (1999)	*Using panel data from Venezuelan manufacturing firms, the authors tested for spillover from joint ventures to plants with no FDI. *Output was modeled as a function of foreign participation at a plant level, foreign participation in the industrial sector and the interaction between plant level and sector level FDI.	*The authors found evidence that FDI negatively affected productivity of domestically owned plants. *Gains from FDI entirely captured by joint venturing firms.
*Technology transfer and spillovers: Does local participation with multinationals matter? *Blomstrom, M. and Sjoholm, F. (1999)	*To examine the effects of technology transfer ion labor productivity for the Indonesian manufacturing industry derived from ownership sharing of foreign multinational affiliates. *The authors modeled labor productivity as the dependent variable while using firm capacity utilization, average production (scale) and ownership as independent variables.	*Findings suggest that technology spillovers are more a result of competition created by FDI than by ownership sharing of multinational affiliates.
*Technology spillovers from FDI in the Indian pharmaceutical industry. *Feinberg, S. (2001)	*Examined whether knowledge spillovers from MNE's and domestic R&D investments affected the Indian pharmaceutical industry.	*Findings suggest that foreign spillovers were among MNE's but not into domestic firms.
*Does FDI transfer technology across borders? *Van Pottelsberg, B. (2001)	*Evaluated whether FDI transferred technology across borders from high technology countries (U.S. and Japan).	*Evidence of larger foreign spillovers were found from U.S. to Japan. *Evidence of Japanese technology spillovers into U.S. was also found.
*Who benefits from FDI in the UK? *Girma, S. (2001)	*Investigated if there is a gap in technology and wages between foreign and domestic firms in the UK and if the presence of MNEs increased domestic productivity levels.	*No evidence of intra firm spillovers were found. However firms with lower than average productivity relative to sector standards gained less from foreign firms.
*Capital flows, FDI and technology spillovers: Evidence from arab countries. *Sadik, A. et.al. (2001)	*To evaluate the impact of FDI in economic performance of Arab countries and its impact on productivity growth.	*FDI inflows were found to generate technology spillovers in Arab countries.

Canada's trade oriented policy is heavily dependent on trade performed with U.S., over fifty percent of Canada's trade, inward and outward FDI involves U.S. firms which has raised concerns about the ability of Canadian firms to compete against their foreign counterparts. This concern has led Canadian researchers to focus their efforts mainly on evaluating productivity differences among countries or productivity spillovers derived from trade or FDI activities.

Industry Canada has performed an important amount of research involving productivity issues derived from international trade activities. The following table is a sample of it, however most of the research has been done at an aggregate industry level mainly for the manufacturing industry and only a few studies have been disaggregated into specific industries.

Among the studies on the processed food industry, Mattson and Koo (2002) analyzed the determinants of the increasing amounts of processed food trade in the U.S. processed food industry, their findings suggests that increasing productivity and free trade agreements are the main contributing factors to this phenomenon. In a USDA report, Henderson et. al. (1996) also discussed the increasing FDI activity of the U.S. processed food industry suggesting that public policies related to transportation, multinational trade, intellectual property rights protection and food processing standards positively influence processed food international trade and FDI. West and Vaughan (1995), and Vaughan (1995) discussed the effects and trends of FDI and trade in Canada's agri-food industry. Bolling, Neff and Handy (1998) reviewed the trends of U.S. FDI in the processed food industry for western hemisphere countries. All previous papers offer a general view of the determinants, effects; trends and policy implications for the industry in the host and some time in the home country, however none of them perform empirical tests on a specific topic.

Globerman (2000) affirmed that *"technological change is a major contributor to growth in productivity but this growth is not uniform among industries"*, which implies the need of performing research at more disaggregated industry level to evaluate the real impact of trade strategies on domestic industries productivity growth.

Our present research is based on two important considerations:

- The first one is the interdependence of the national stock of knowledge on domestic and international R&D activities.
- The second one is the role that FDI is playing as a technology transfer tool for the Canadian manufacturing industry.

Then it is of our interest to evaluate if FDI is contributing to innovation and industry growth through technology spillovers to the Canadian agri-food industry. Furthermore by doing our analyses at an aggregate industry level (FB&T) we might not be able to capture the effects of FDI in specific FB&T sub sectors, given that technological spillovers occur most prominently within industry sub sectors.

2.9 Summary

This section provided a brief description of empirical work that has previously been done with regards to the effects of FDI on national economies. These reviews will allow the specification of models and variables to test for the objectives of this thesis. The first objective is to evaluate the effects of FDI on export performance, even though some authors suggest a complementary effect between FDI and exports (Fontagne, 1999; Sun, 2001), Brouthers et. al. (1995) suggests that this relationship depends on the objective of the FDI. To evaluate the factors that determine the MNEs choice of entry mode is the second objective. The third objective is to evaluate what are the main factors that attract FDI. Literature also suggest among these factors, education, trade agreements, R&D intensities as key attractors of foreign capital. To evaluate technological spillovers from FDI is the last objective. There are not consistent results in the literature about positive or negative effects, however authors suggest that domestic R&D activity is a major contributor to productivity growth.

Based on the discussion about measuring these effects at different levels of industry aggregation in this section, this research will be performed for the Canadian food, beverage and tobacco industry as well as for the dairy and grain handling industry, in order to determine if the results derived by evaluating an aggregate industry are consistent with results obtained when evaluating disaggregated industrial sectors.

2.10 Conclusion

The effects of FDI on national industries still under scrutiny, these effects are not uniform and depends on domestic and specific characteristics of the involved industry and nation; overall knowledge transferability, and the exploitation of the host country domestic advantages are the main motivations to foreign direct invest. Knowledge owners are not eager to spread their knowledge to their competitors, therefore host countries and industries whose main motivation is to increase productivity through R&D benefits should carefully evaluate if domestic policies, infrastructure, population and industry provide conditions to compete against foreign multinationals and mainly to reach the objectives for which FDI has been allowed to enter an specific industry. Empirical work about FDI determinants and multinationals choice of entry to new markets are in essence consistent, however when evaluating FDI spillover effects on home industries or nations results are not uniform. Given that Canadian researchers have mainly focused on productivity differences and productivity spillovers between domestic and foreign

corporations as well as researching the FDI attractors at an aggregate industry level, there is a need to perform research at a further industry detail not only with the purpose of forecasting the effects on producers, consumer and industries but also to plan ahead what and how relocate resources that could be available due to an increased international and domestic industrial competition.

The literature reviewed in this chapter allowed us to understand the different approaches taken by authors to test for objectives that are related to this thesis. In order to test for our research objectives, the models to be used will be based on empirical work approached in this chapter. An important addition will be the inclusion of a causality analysis that will allow us to identify possible existing causal influence between the dependent and independent variables included in our analyses.

Table 2-5 Literature review: FDI and TFP growth in Canada

Research title/Author & date	Research topic and methodology	Findings
*Linkages between technological change and productivity growth *Globerman, S. (2000)	*Summarize relevant literature dealing with the linkages between technological change and productivity change. *No empirical test is conducted.	*Technological change is a major contributor to productivity growth. However the contribution is not uniform across firms, industries and countries.
*Determinants of Canadian productivity growth. *Harris, R. (1999)	*This discussion paper is based on a conference about "The future of the Canadian Economy" and analyzes the determinants of productivity. *No empirical test is conducted	This paper provides a policy framework for future actions to promote productivity growth in Canada.
*International R&D spillovers between industries in Canada and the United States. *Berstein, J. (1994)	*To discuss the effects of domestic and foreign spillovers on average variable costs of production and factor intensities (input/output ratios) for eleven manufacturing industries of U.S. and Canada. *This research model includes the use of cost functions in the analysis.	*US R&D spillovers for the Canadian food & beverage industry: -Foreign spillovers cause avg. variable costs to decrease for more than 1% -R&D is complementary to international spillovers.
*Inter-industry and U.S. R&D spillovers, Canadian industrial production and productivity growth. *Berstein, J. (1998)	*This paper investigates the extent to which inter-industry and intra-industry R&D spillovers exist from US to Canadian industries. 11 manufacturing industries where evaluated for the period (1966-1991).	*Eight of the eleven examined industries did not have international/inter-industry spillovers. *For the food and beverage industry, evidence of international intra-industry and inter-industry spillovers were found.
*Multinationals in N America. *Eden, L. (1994)	*This book is a collection of studies about multinationals and its effects on different custom areas and on specific North American countries.	*Different policy considerations emerge from the papers contained in this publication.
*U.S. foreign direct investment in the western hemisphere processed food industry. *Bolling, C. et. al. (1998)	* The paper offers an aggregate view of the trends of U.S. FDI in the processed food industry in different countries of the western hemisphere.	*The author suggests that during the 1990's FDI and trade in the processed food industry have a complementary effect in the way to access international markets
*Processed food trade and foreign direct investment under NAFTA *Mattson, J. and Koo, W. (2002)	*To analyze the determinants of processed food trade between US with Canada and Mexico. *Authors used three different equations using export, FDI, exchange rates, GDP, inflation, labor costs and dummy variables as independent variables. The dependent variables where FDI, exports and imports.	*Findings suggest that the increase in processed food trade between these countries can be explained by growth in real GDP and the effect of trade liberalization as well as labor cost and inflation in host countries.
*MNEs firms investment and trade in Canada's food and beverage industry: Policy implications *West, D. and Vaughan, O. (1995)	*Based on a survey performed to Canadian and U.S. firms, the motivation of the paper was to obtain information about how firms perceive the importance of international markets, the methods they use to enter new markets and the factors influencing these decisions.	*A description of the motivations of the firms to become international as well as the methods to enter new markets is provided in the working paper.

*Implications of FDI for the Canadian food and beverage manufacturing industry * Vaughan, O. (1995)	*This paper is an extension of the results obtained by interviewing Canadian and U.S. firms. *The trends of FDI and trade in Canada's processed food industry are discussed	*An aggregate view of the effect of FDI on the Canadian processed food manufacturing industry is provided. *Comments on policies to promote trade and investment are also generated in this paper.
*Globalization of the processed foods market *Henderson, D., Handy, C. and Neff, S. (1996)	*A description of patterns of international commerce in processed foods industry are described. *The impact of such commerce on US and foreign consumers, producers and firms. *The factors that motivate foreign affiliate activities are also discussed.	*This report edited by the USDA provides a general view of the U.S. processed food industry, issues related to trade, motivations to trade, policy effects and impact of FDI and trade to consumers, and industries are approached in this report.
*R&D propensity and productivity performance of foreign-controlled firms in Canada. *Tang, J. and Rao, S. (2001)	*Using firm level data, this paper examines the R&D propensity of Canadian-controlled and foreign controlled firms in Canada (1985-1994) • This research used data on firm size, export orientation and industry composition. A simple regression model was used to evaluate the R&D propensity of firms.	*Foreign controlled firms actively adopt advance technology form parents firms which might explain its higher productivity over Canadian controlled firms.
*Foreign direct investment and productivity growth: The Canadian host country experience *Gera, S. et. al. (1999)	*This paper analyzes the impact of technology transfers and spillovers from inward FDI on production costs and structure of Canadian industries. The estimation model consists on the use of a cost equation and three share equations for capital, labor and intermediate goods. The study used cross sectional data for 13 Canadian industries.	*Findings suggests that inward FDI lowers production costs and increases productivity in most Canadian industries *Evidence of positive international R&D spillovers was also found for the Canadian manufacturing industry.
*Are Canadian controlled manufacturing firms less productive than their foreign controlled counterparts? *Rao, S. and Tang, J. (2000)	*The objective of the paper is to analyze the multi-factor productivity gap between Canadian and foreign controlled manufacturing firms. *Using firms panel data, the study analyzes the effect of labor quality, firm vintage, export orientation, firm size, and unionization on multi-factor productivity.	*Canadian manufacturing firms were found to be 25% less productive than their foreign counter parts.(1985-1988). *Results suggest that Canadian FDI orientation was not responsible for the poor productivity performance of the Canadian manufacturing sector during the 1990's.
*R&D, international technology spillovers and the TFP growth of manufacturing industries in Canada. *Hanel, P. (2000)	*Using domestic and foreign R&D proxies, the author evaluates if technology spillover are derived from FDI on total factor productivity (TFP) for the Canadian manufacturing industry. *TFP growth is modeled as a function of foreign and domestic R&D intensities and inter-industry spillovers.	*Significant nexus between industry's own R&D expenditures and TFP growth. *International spillovers contribute the less to TFP growth compared with domestic and inter-industry spillovers.
*FDI and spillover efficiency in the Canadian manufacturing industries *Globerman, S. (1979)	*To evaluate if economic benefits of FDI exists for the Canadian manufacturing industry. *Labor productivity is used as the dependent variable while capital, labor, education, wages and tariff were used as independent variables.	*The author found evidence of positive relationship between the degree of foreign ownership and labor productivity growth.
*Multinational firms, competition, and productivity in host-country markets. *Caves, R. (1974)	*To test for benefits derived from FDI in the Canadian and Australian manufacturing industry. *The author modeled profits by Canadian owned firms as a function of profits by joint ventures, (with different share of foreign ownership), assets, firm size, value added, changes in foreign ownership.	*The author did not find evidence that the domestic private sector benefits from foreign subsidiaries activities. *Indirect spillover benefits on productivity arise from multinationals activities due to allocative & technical efficiency as well as technology transfer
*The determinants of interindustry variation of foreign ownership in Canadian manufacturing. * Saunders, R. (1982)	*To prove that foreign ownership in Canada's manufacturing sectors determined by the ability to exploit intangible assets, relatively labor costs and managerial resources.	**Findings suggest that high intensity of managerial resources and low relative wages are the main source of FDI activity in Canadian industry.

Chapter 3 THE CANADIAN AGRI-FOOD, DAIRY, AND GRAIN & OILSEED MANUFACTURING INDUSTRIES; DESCRIPTION AND REGULATIONS.

Introduction:

As a component of the food, beverage and tobacco industry, this chapter describes the importance and the contributions of the dairy and grain & oilseed manufacturing sectors to the Canadian economy. By providing a description of the regulatory framework governing both sectors, this chapter will illustrate how different regulatory frameworks within the same industry affect production and the balance of trade in "sister" sectors, reinforcing the importance of conducting a disaggregated industrial analysis to better understand the impacts of any decisions in specific industries. This chapter will also describe the industry concentration pattern that is taking place in both sectors (dairy, and grain and oilseeds manufacturing) in which MNEs are playing an important role, not only by capturing increasing market shares, but also by affecting the domestic firm's business structure (from cooperative structure to private firms).

3.1 The Canadian agri-food industry.

The Canadian agri-food industry encompasses commodities such as livestock and grains, semi-processed products, such as flour and further value added goods such as canned goods, food ingredients and beverages. This industry is an important component of the Canadian economy, contributing about 8.4 percent of the gross domestic product, also nearly one in seven Canadians are employed in this industry directly or indirectly. During 1999, Canadian agri-food exports represented 3.52 percent of the global agri food trade (Team Canada, 2002).

Historically, Canada was known as "the bread basket of the world" because of the quality and quantity of its grain production. Today Canada is supplying the Asian, European and Latin American markets with a growing range of higher value processed products. Currently, Canadian exports of processed foods exceed exports of primary products. In a decade, Canada's balance of trade in processed agri-food products shifted from a deficit of over $2 billion in 1989 to a surplus in excess of $1.5 billion in 1999. An important share of these exports are accounted by grain and oilseeds primary and processed products, they still account for a significant share of Canadian agri-food exports (Team Canada, 2002).

Currently, through the Canadian Agri-Food Marketing Council (CAMC), Canada is engaged on increasing its global market share of exports of agri-food products. The country is willing to

control at least 4 percent of the global market by the year 2005. According to the CAMC, to be successful in meeting the goal, this sector "will have to capitalize on the higher value added and strong trade performance of processed products". The CAMC is counting on increasing the export share of processed agri-food products to at least 60% by 2005 (http://sea.agr.ca). Since the late eighties, Canada joined several trade agreements which in addition to some domestic policy changes are enhancing the production of value added products given that the industry has the opportunity to access growing international markets with fewer barriers to trade. According to Agriculture and Agri-food Canada, the country agri-food processing sector is one of the most competitive in the world as a consequence of the high tech, high value and knowledge involved in the production process. In addition, Agriculture and Agri-Food Canada (AAFC) offers firms dollar for dollar matching funds when they participate in collaborative research projects through the "Matching Investment Initiative (MII)" R&D program.

3.2 The Matching Investment Initiative (MII).

The MII is a federal program that could also influence MNEs decisions to invest as well as the industry resulting performance. The Matching Investment Initiative (MII) was founded in 1995; it is not a tax incentive program nor supports other industries than the agri-food industry. It is the result of an Agriculture and Agri-Food Canada (AAFC) departmental initiative to increase the level of collaborative research and development activity between industry and the department and between industry and the Canadian Food Inspection Agency (CFIA). The objectives of the MII are to:

- Strengthen Canadian agri-food technology development and commercialization through enhanced market-driven collaboration.
- Accelerate the process of technology transfer through collaborative research agreements.
- Increase collaboration between the government and the industry in research and development.

Overall, under the MII program, it may match up to 100% of the industry's contribution to a collaborative R&D project may be matched, resulting in a government/industry cost-sharing ratio for any project could reach a maximum of 50/50. The importance of this program is that the strong support to R&D activities shown by the Canadian government can position Canada as a good place for MNEs to invest, develop technology and increase productivity oriented not only to

supplying the domestic market but also to take advantage of the key Canadian geographical position with respect to U.S.

Table 3-1 Matching Investment Initiative (MII)

Year	MII C$ Million (AAFC)
1995-1996	12.5
1996-1997	21.6
1997-1998	29.6
1998-1999	35.2
1999-2000	35.8
2000-2001	35.8

3.3 Canadian agri-food industry regulations.

The agri-food system is an important component of the Canadian economy that accounts for 8.4% of gross domestic product (GDP) and 13.2% of total employment (Ash, 1998). The food and beverage (F&B) processing sector by itself contributes 2.5% of Canadian GDP. Canada's agri-food global trade is characterized mainly as bulk commodity exporter and intermediate goods, where grains and oilseeds are the largest export commodities followed by livestock and meat products. Investment in this sector has begun to increase in the last decade where Canadian controlled establishments continue to create higher amount of jobs while foreign controlled establishments are generally characterized by larger plants, higher value-added production, higher productivity levels and higher pay rates (Ash, 1998).

Globalization and increasing shares of foreign capitals in the industry have motivated government intervention in the areas of market regulation, income stabilization, export promotion and grain transportation (eliminated in 1995) (Ash, 1998). Given that this research focus is on the agri-food industry, specifically the grain and oilseed manufacturing industry and the dairy manufacturing industry, a detailed description on government policies affecting only these industries will be provided.

3.3.1 Market regulation policies

Concerns about production and long term viability of some agri-food sectors gave birth to what is known as "marketing boards" with the purpose of ensuring "orderly marketing" of certain agricultural commodities in order to stabilize agricultural markets and to improve producer's prices. In Canada, the most significant applications of marketing boards are the (i) supply management system and (ii) the Canadian Wheat Board (CWB).

- **The supply management system** covers dairy and poultry products and has the objective of raising and stabilizing prices through controlling domestic production (marketing), controlling imports (by tariffs) and pricing (Ash, 1998). Domestic production controls are intended to achieve balance in product domestic supply and demand. The system operates by forecasting product demand in order to allocate production targets to each province. Individual farm production is controlled through a quota system administered by provincial agencies. Import controls have faced some problems, quantitative border restrictions were permitted under the general agreement on tariffs and trade (GATT), but after Canada joined the world trade organization (WTO) agreement on agriculture, import quotas were forced to be replaced by equivalent tariff protection which has been set high for supply management commodities protecting the Canadian domestic market (Ash, 1998; Canadian Dairy Industry Profile, 2002).Administered prices exist for industrial milk, fluid milk and poultry products. A target price for industrial milk is set annually by the Canadian Dairy Commission, mainly based on cost of production.

  The Canadian Wheat Board was established in 1935 as a single desk seller for wheat and barley grown in western Canada. The objectives for which the CWB was conceived are (i) to maximize net producer returns from the marketing of wheat and barley grown within the CWB region, (ii) to equalize prices to producers at a given location, through a system of price pooling for a given quality of grain in each crop year, (iii) to provide equitable access for farmers to the grain handling and transportation system (iv) to provide producers with guaranteed initial payments and (v) to pool returns, distributing any surplus funds after payment of board expenses so that all producers realize the same return for the same grade of grain, net of primary elevator and cleaning costs and transportation to the nearest designated base point (Schmitz and Furtan, 2000).

  The CWB is the single body in Western Canada with the right to sell and export wheat and barley that is grown in the CWB area. The board is obligated to accept all grain delivered as

called for in delivery contracts it administers, but does not have control over supply. The board is also obligated to make initial payments. The CWB regulations ensure equitable access to the handling system for producers of wheat and barley, and afford the board a role in allocating railway cars to transport grain to market (Schmitz and Furtan, 2000; Ash, 1998).

3.4 Profile of the Canadian dairy industry

The dairy industry is the third largest sector of the Canadian agri-food economy after grain and red meats. During 2001 Canadian dairy products were valued at close to $10 billion, accounting for 13.7% of all processing sales in the F&B industry in Canada, this industry employs over 45,000 people working in dairy farms and in the primary processing level (http://www.dairyinfo.agr.ca/). The market for milk in Canada is highly regulated and is divided into (i) fluid market, table milk and cream which accounts for about 40% of the milk produced, and the remaining 60% is (ii) manufactured into dairy products (butter, cheese, ice cream and yoghurt). Milk produced on the farm is sold to the various dairies or processing plants. The Canadian dairy industry has seen significant rationalization over the past decades; several factors are responsible for this trend. First of all, the specialization of dairy farms and the reduction of transportation costs (obtained through economies of scale and technical gains) made the consolidation of processing enterprises possible. In addition provincial government programs encouraged consolidation, by paying small processors to shut their doors. Static or declining industry output has provided another significant incentive for processors to consolidate as a means of increasing market share. With mergers firms have found they can reduce plant over capacity, combine resources and skills and reduce costs by operating fewer but larger and more efficient plants. Although the number of plants has been cut in half since 1975, the rate at which plants have disappeared from production accelerated between the years of 1988 and 1995 when the number of establishments dropped 25.8%. An additional factor is the consolidation of enterprises in the retail sector. Retailers now require their suppliers to provide larger quantities than in the past. To meet the demand, processors must increase their production. Furthermore, since retailers now have branches in more than one province, processors must also follow this trend and expand their markets to several provinces. Finally, market globalization also affects this rationalization trend, since Canadian companies have to compete increasingly with foreign companies locally. As a consequence of industry rationalization, some companies have shut down and others have merged to become more competitive and productive. This downward trend has

been continuing for many years now but accelerated since 1990. In 1965, there were 1,413 plants in Canada. By 2000, the number of processing plants was 275, including 219 industrial milk plants and 56 fluid milk plants (some of them processed both fluid and industrial milk). During 1999-2000, approximately 80.6 million hectoliters of milk were produced for sale in Canada for these two markets. From a regional perspective, the industry is heavily concentrated in central Canada. Ontario and Quebec account for more than 60% of all plants and about 75% of all industry output. Ontario is the leading producer of packaged fluid milk products and ice cream, while Quebec leads in production of butter, cheese and yogurt. In 1999 data indicated that Ontario had the greatest number of plants (97) and shipments with a value of $3.17 million, while Quebec had 74 plants and shipments with the highest value at $3.20 million (Agriculture and Agri-Food Canada (http://www.dairyinfo.agr.ca/).

The Canadian dairy (processing) industry is integrated by three "main" organizational structures. The most dominant were producer-owned cooperatives which accounted for about 60% of industry output during 1998. The difference was shared between foreign owned multinationals and Canadian owned companies of different sizes. Industry ownership has become highly concentrated, up to the year 2000, three organizations had annual dairy products sales of over $1 billion each and five organizations controlled 50% of all industry plants and accounted for 60% of production, however, recent mergers (Agropur/Lactel, Saputo/Dairyworld) suggest a higher industry control by three firms (Parmalat Canada, Saputo Inc. and Agropur) in the future. The presence of Parmalat in Canadian markets is recent since it was established in Canada during 1997 by purchasing Beatrice and Ault Foods. Parmalat has since acquired several other companies or their divisions. Parmalat was the largest dairy processing company in Canada until the end of 2000. With the acquisitions of Agropur/Lactel, Saputo/Dairyworld, it is hard to establish which of these companies will take over as the leading Canadian dairy firm (http://www.dairyinfo.agr.ca/).

Dairy co-operatives have played an important role in the development of the Canadian dairy industry; however their relevance in the dairy market has been declining with the increasing presence of private domestic and MNE's in Canada. Dairy co-ops are producer owned dairy processing and marketing businesses. By 1999, there were 24 dairy co-ops in Canada, most of them located in Quebec (12), however they were also dispersed in the Prairies, B.C. and the Maritimes given the importance of the volume of industrial milk produced by these provinces (Co-operatives Secretariat- Annual Report 2001). Until the early 1990s, co-operatives operated

mainly on local markets. In recent years, they have actively been acquiring other companies or merging with them, by doing so they increased their market share to over 60% in 1999 (Figure 3-1) as compared with 46% in 1990. However during 2001 Agrifoods International Co-operative (Canada's third leading dairy enterprise in 2000) was acquired by Saputo Inc. which implies a major shift in ownership in the dairy sector in Canada (Figure 3-4).

Table 3-2 Top companies in the Canadian dairy sector

Enterprises	*Ownership type*	*Country of origin*
Parmalat Canada	Private	Italy
Agropur Co-op	Co-op	Canada
Saputo, Inc.	Private	Canada
Kraft Canada	Private	U.S.A.
Nestle Canada	Private	Switzerland
Unilever Canada Limited	Private	U.K.
Neilson Dairy	Private	Canada
Gay Lea Foods	Co-op	Canada
Scotsburn Coop Services	Co-op	Canada
Farmer's Coop Dairy Limited	Co-op	Canada

3.4.1 Dairy Industry Regulatory Framework

In the dairy industry regulatory framework each province is responsible for the production of its own milk and sets its own pricing formulas, quota policies and other regulations. The federal government has jurisdiction over the industrial milk market, which is administered through a federal-provincial agreement (The National Milk Marketing Plan). Canada adopted a system of supply management for industrial milk in order to balance the demand for dairy products and the supply of industrial milk. The domestic market is primarily supplied by Canadian milk production, except for small volumes of dairy imports. The Canadian Milk Supply Management Committee (CMSMC) oversees the application of the national plan. The committee is chaired by the Canadian Dairy Commission, and has representatives from producers and governments from all provinces. The national dairy policy contains the following key elements; milk supply management through market sharing quotas, import controls on dairy products, establishment of a target price for industrial milk based on a cost of production formula, federal government support for the target price through a direct payment to milk producers (eliminated in Feb. 2002) and support prices for butter and skim milk powder (Agriculture and Agri-Food Canada. Dairy Industry Profile, 2002).

Source: Cooperatives Secretariat annual reports

Figure 3-1 Dairy coops market share

As a part of the dairy industry marketing strategy there are three important pooling agreements that are managed by the Canadian Dairy Commission:

- Class 5 Pricing and Pooling: Under this system implemented in August 1995, industrial milk is classified and made available for use in dairy products and products containing dairy ingredients at prices which vary according to its end use. This pooling agreement provides a means for revenues to be shared (pooled) among all provincial signatories to the National Milk Marketing Plan. In this way, the market returns from the sale of milk to processors for special class purposes are pooled among all dairy producers.
- Eastern all Milk Pooling (P6): Six provinces have taken the revenue sharing approach contained in the class 5 pricing and pooling system a step further. Beginning with August 1996 returns, the revenues from all milk sales have been pooled among Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island dairy producers. The "P6" agreement also provides for several harmonization elements, including multiple component prices, a daily quota system and quota exchange, and the end use pricing components.
- Western Milk Pool (P4): In March 1997, the four western provinces (Manitoba, Saskatchewan, Alberta and British Columbia) also implemented an all milk pooling system. Although Manitoba is part of the western milk pool, it also participates in revenue sharing with the eastern all milk pool (Agriculture and Agri-Food Canada. Dairy Industry Profile, 2002).

3.4.1.1 Federal and Provincial Responsibilities in the Dairy Industry

The Canadian Dairy Commission (CDC) arose as a part of the federal responsibilities within the dairy industry. The CDC is a crown corporation created in 1966; it has played a key role in the evolution and implementation of the national dairy policy. Working closely with provincial marketing boards, producers, processors and exporters, the commission advises the minister of Agriculture and Agri-food Canada on matters pertaining to dairy and develops policies and programs to meet the needs of the industry while providing Canadians with adequate supplies of quality dairy products. A number of federal government departments also have responsibilities in the dairy industry. Agriculture and Agri-food Canada's mandate includes dairy research, livestock development, animal health, policy development, as well as market and rural sector promotion. The Canadian Food Inspection Agency is responsible for the establishment of dairy products standards, product grading, plant inspection, regulating packing, nutritional labeling, animal health and the monitoring of the safety dairy products.

Imports of most dairy products are subject to tariff rate quotas (TRQ's) administered by the Department of Foreign Affairs and International Trade. Tariffs within the TRQ's and the high over quota tariffs are administered by Revenue Canada. Health Canada continues to develop standards and policies for the safety of dairy products, which are applied by the Canadian Food Inspection Agency (Agriculture and Agri-Food Canada. Dairy Industry Profile, 2002. http://www.agr.gc.ca).

Provincial responsibilities are managed through the provincial marketing boards and agencies. They govern the production and marketing of milk within their own borders. Marketing activities related to industrial milk are carried out under concurrent federal and provincial legislation (Agriculture and Agri-Food Canada. Dairy Industry Profile, 2002).

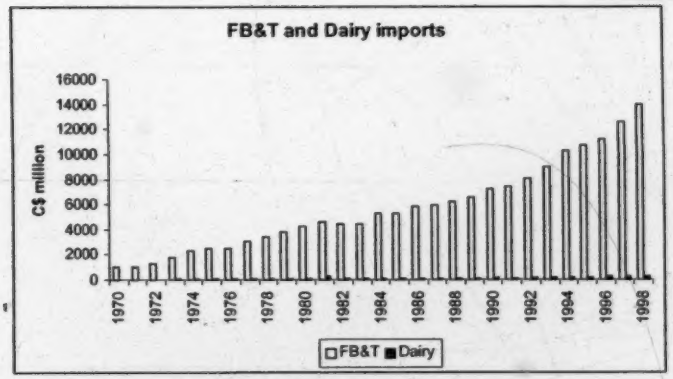
In order to manage the marketing of milk, provincial governments delegate statutory powers to either provincial agencies or marketing boards. Although responsibilities vary from province to province, boards and agencies generally license producers, establish prices paid to dairy farmers and, in the case of fluid milk, determine provincial demand and allocate quotas to producers. As well as managing fluid quota, designated provincial marketing authorities administer the decision of the Canadian Milk Supply Management Committee (CMSMC) which oversees the National Milk Marketing Plan. They distribute the provincial shares of the national market sharing quota (MSQ) for industrial milk producers. Departments of agriculture in all provinces manage and control dairy quality programs and set sanitary standards at the production and processing levels.

In Ontario and Quebec, plant allocation quotas or supply agreements, are used principally for milk required to make cheese, but also for butter, milk powders, condensed and evaporated milk and ice cream production. Plants manufacturing these products cannot operate with out having acquired such quotas. The administration guidelines of plant quotas are negotiated between the provincial milk marketing authorities and the processors. The impact of plant allocation quotas or supply agreements is that in periods of occasional shortages competing plants cannot bid for milk supplies. Since fluid milk plants have the highest priority for available fresh milk supplies, unexpected strong consumer demand for fluid milk, could result in less milk being made available for industrial plants (Agriculture and Agri-Food Canada. Dairy Industry Profile, 2002).

3.4.1.2 International Trade in the Canadian Dairy Sector

The previous description of the Canadian dairy industry illustrates it as a highly regulated industrial sector. The regulations in place since the 1970's, were oriented to protect the Canadian domestic dairy market, this objective was achieved by the implementation of dairy product import controls (quotas) since the mid 70's. One characteristic of the Canadian dairy industry is that the Market Share Quota (MSQ) system implemented by the Canadian Dairy Commission and the implementation of subsidies to milk production resulted in high domestic prices of dairy products making the Canadian market attractive for foreign dairy exporters. As mentioned above, quotas to dairy products came in place in order to protect Canadian producers and the Canadian dairy market as well as to stabilize prices. Overall, the regulatory scenario governing this industrial sector made it a "trade static" sector, imports and export of dairy products were insignificant if compared with other sub sectors (such as the grain and oilseed sector) or the food and beverage industry as a whole (Figure 3-2), however this tendency is starting to change. During the last five years Canadian dairy exports have been increasing.

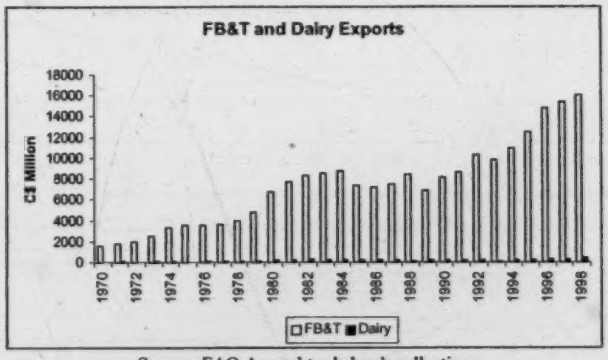
During the late 80's and early 90's, Canada signed free trade agreements with U.S. which later evolved to the North American Free Trade Agreement (NAFTA) which also included Mexico as a new trading partner. Canada also joined the Uruguay Round Agreement on agriculture (GATT) in 1995. These agreements represented new market opportunities for the Canadian industry but also represented challenges because the agreements were oriented to eliminate any existing trade obstacles, forcing all signing countries to decrease subsidies and export support as well as to change quotas to tariffs and to eliminate state intervention in trade.



Source: FAO Annual trade book collection

Figure 3-2 FB&T and Dairy products imports

Canada's industrial and market protection policies have been challenged several times by Canada's trade partners, as a consequence, during 1995; the Canadian government established a two-tier pricing system (which was intended to promote exports of Canadian dairy products without leaving unprotected the domestic market). The new pricing system allowed processors to pay higher prices for milk used domestically and lower prices for milk used for exports (price pooling system). Given that the new plan has still been challenged by Canada's trade partners, Canada argued that the discounts applied to exports were not an export subsidy, and therefore not subject to the limits agreed upon in the Uruguay Round. Again, a series of trade disputes cornered Canada's federal government to eliminate this Export Program in August, 2000.



Source: FAO Annual trade book collection

Figure 3-3 FB&T and Dairy exports

Instead, the country's provincial governments implemented new export programs "with the apparent involvement" of the federal government.

Table 3-3 Dairy industry policy and trade events

DAIRY INDUSTRY POLICY AND TRADE EVENTS	
1970	The Market Sharing Quota (MSQ) plan is established in Canada by the Canadian Dairy Commission (CDC).
1974	The Canadian Dairy Commission pays for the first time a direct subsidy on al MSQ shipments.
1975	Direct subsidy capped at $6.03/hl. Introduction of cheese import quota to the Canadian market.
1982	Import controls to the Canadian market increases, additional to the cheese import quotas, quotas are also imposed to sweetened condensed milk and buttermilk powder. Special permits are required to import casein, butter, dry skim milk, dry whole milk and dry whey.
1985	Products containing at least 50% of dairy products become subject of import control.
1988	Free Trade Agreement with U.S. is signed. Canada includes ice cream and yoghurt as dairy products with import restrictions.
1989	Free Trade Agreement with U.S. came into force. A trade dispute panel discusses the "legality" of yoghurt and ice cream import controls to the Canadian market. The Panel rules against Canada's import control practices.
1987	North American Free Trade Agreement (NAFTA) signed.
1994	NAFTA enters into force.
1995	WTO agreement enters into force. Import quotas on Canadian dairy products converted into tariffs. Canada introduces a two-tier pricing system in which processors paid higher prices for milk used domestically and lower prices for milk used for exports. Direct subsidy payment reduced by 15% to $4.62/ hl.
1996	Direct subsidy payment reduced 15% to $3.80/ hl.
1997	U.S. and New Zealand request GATT article XXII consultations arguing that Canada operates through the Canadian Dairy Commission a two price system that provides export subsidies in excess of Canada's commitments on export subsidies under the WTO agreements on agriculture. Parmalat invests in the Canadian Dairy industry accelerating the Canadian dairy industry consolidation process.
1998	Direct subsidy to be phased out over a five year period. The first of these annual reductions occurs. The subsidy accounts for $3.04 /hl. 60% of the Canadian dairy market is controlled by dairy cooperatives; the difference is controlled by MNE's or private companies.
1999	Direct subsidy reduced to $2.28 /hl. The panel's final report about Canada's export subsidy program is released ruling against Canada, however after a Canadian appellation, the WTO appellate body rules on favor of Canada's to limit imports under a tariff rate quota (TRQ) scheme.
2000	Canada designed a "new" dairy export program in each province, however the essentials of the previous export program remained. Again U.S. and New Zealand appealed to review the "new" Canadian dairy export program to the WTO. Canadian dairy industry becomes "highly" consolidated; three firms controlled over 50% of the Canadian dairy industry (Parmalat Canada, Saputo Inc. and Agropur).
2001	The WTO ruled against Canada's dairy export practices.
2002	Canada placed a new appeal to the latest WTO announcement in which reaffirmed that Canada was violating its WTO commitments.
2003	The WTO rules against Canada's dairy export policy.

All exports were carried out through private exporters using Class 5(d) permits administered by the Commission. All export activities of the commission were authorized by the Milk Management Committee and considered to fall within Canada's World Trade Organization export commitments. This did not stop New Zealand and the U.S. from taking Canada to the WTO, and earlier this year Canada was found to be illegally subsidizing exports. The result has essentially stopped all exports of dairy products from Canada.

3.5 Profile of the Canadian cereal grain flour industry.

Canada produces a wide variety of grains and oilseeds, grains include wheat, corn, oats, barley and rye while oilseeds include canola, soybean, flaxseed, safflower and sunflower seeds all of them used for both human and animal consumption.

The western Canada grain industry is one of the largest segments of the Canadian agri-food sector and its importance (in commerce) is comparable with the forestry, automobile manufacturing industries as well as with the mining and fishing industries (Estey, 1998).

The commerce of grains and oilseeds represented around $12 billion a year for which provinces of western Canada account for over 80% of total cultivated land (39.4 hectares). On average, Canada produces 60 million tones of grains and oilseeds a year (Canada produced 61.7 million tones in 2000-2001) and about half is oriented to the international markets where the board grains (Canadian Wheat Board) accounts for about 80% of total exports (Estey, 1998). During the year 2000 Canada exported $9.2 billion worth of grains, oilseeds and related products representing 40% of total agri-food exports (http://ats-sea.agr.ca/supply/e3305.htm).

Central to the Canadian grain industry is the presence of the Canadian Wheat Board (CWB) which has sole responsibility for and jurisdiction over selling wheat and barley grown in the Prairies and the Peace River region of British Columbia destined for human consumption, domestically or for exports. The CWB is not involved in the marketing of corn, oats or rye and it does not have jurisdiction in central and eastern Canada. The CWB conducts this business by exercising its monopoly right to buy all grain from the farmer at prices estimated by them and to sell them domestically or abroad. Even though the board participates in additional activities to marketing (transportation and storage), the board does not have elevator and transportation assets (with the exception of some hopper cars) and relies for these purposes on the facilities of railways and grain companies (further detail will be provided in the following section). The Board is responsible for issuing export licenses for wheat and barley exports from any region of Canada.

The board achieves its objectives by marketing wheat and barley of more than 110,000 western Canadian producers to domestic, US and offshore customers. The CWB monitors international and domestic market conditions and thus sends market signals to producers through initial pricing, pool return outlooks and other detailed market information (Schmitz and Furtan, 2000).

The CWB directs movement of board grains through delivery quotas and contracts and allocates shipping orders for rail cars to companies handling CWB grains. The CWB can either deal directly with the buyer or with grain companies which act on its behalf. There are 24 accredited exporters (AEs) and two international exporters (IEs) which purchase grain from the Board for resale to customers. The customer decides whether to deal directly with the CWB or with an AE.

One of the key elements of the CWB marketing system is the partnership with the federal government related to three activities. First, the government guarantees the CWB's initial payments. If returns from sales are not sufficient to cover the initial payments, the federal government offsets the deficit. Secondly, the federal government guarantees the borrowing of the CWB to finance its business. This allows the CWB to borrow money at lower interest rates. Finally the federal government guarantees payments on authorized credit grain sales thereby ensuring that farmers are not exposed to the risk of buyers defaulting on payments.

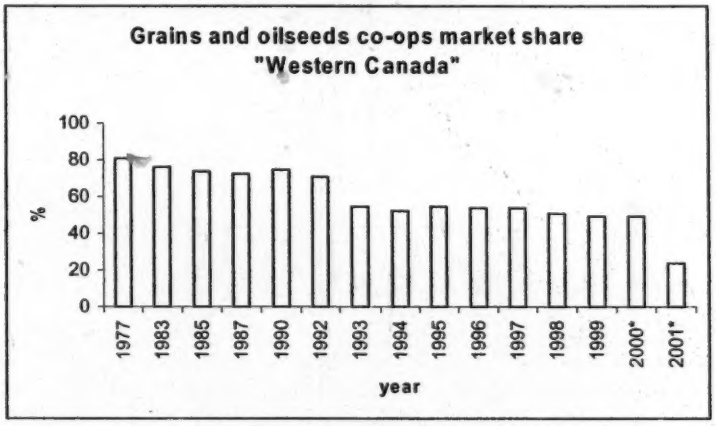
Other than the CWB there are several producers, federal, provincial organizations linked to the grain and oilseed industry. Among them is the Ontario Wheat Producer's Marketing Board (OWPMB) which is a provincial marketing agency. As the CWB the OWPMB is a single desk marketing agency that represents around 18,000 wheat producers in eastern Canada, its operation is alike the CWB (http://ats-sea.agr.ca/supply/e3305.htm).

It is important to mention that transactions involving grains not marketed by the CWB or the OWPMB are normally referred as to "open market" transactions and the most common scenario id for the farmer to sell his grain directly to an elevator company for a flat price that is the final price. The price is set by the elevator company taking into account the relevant future prices, handling, cleaning, storage, financing, and transportation costs.

3.5.1 The Grain Companies

As mentioned earlier, as part of the CWB sales function, it relies on agents (grain companies) through which the board makes the necessary arrangements for the sales contracts on domestic and foreign markets. The reason of including grain companies in the board activities is because

they owned the grain elevators and inland terminals. A great number of the infrastructure was owned by agricultural cooperatives and companies owned or controlled by farmers (Saskatchewan Wheat Pool, United Grain Growers, Alberta Wheat Pool, Manitoba Pool Elevators, among others), however coops are decreasing in number and their influence in the grain handling industry is being overwhelmed by private and foreign companies. Up to 1997, 85% of the Canadian grain handling industry was controlled by five major firms, UGG (17%), Saskatchewan Wheat Pool (31%), Alberta and Manitoba Pools (26%), and Cargill (12%); of which three of these companies were Canadian cooperatives controlling over 50% of the grain handling business (Dominion Bond Rating system, 1998) (figure 3-7)



Source: Cooperatives Secretariat Annual Reports.

Figure 3-4 Grain and oilseeds co-ops market share

In present times, some of these grain companies are joint ventures or wholly owned subsidiaries of vertically integrated foreign corporations (Appendix AH) engaged in the operation of elevators, grain brokerages and associated businesses as well as the production of a wide array of value added farm products on a large international scale.

The presence of foreign capital in this industry is "observed" as a conflict of interest or a "divided loyalty" on the part of the grain companies affiliated multinationals. MNEs such as Cargill, Inc. and Louis Dreyfus are major players in the international grain markets. In addition to acting as agents for the CWB, they operate large accounts with which they buy grain outright from farmers and sell it to foreign buyers. Cargill, Inc. and Archer Daniels Midland (ADM) are significant soybean crushers. ADM has been an especially active player in Canadian grain for the last five years. ADM invested in United Grain Growers Ltd (UGG) shares during 1997 and expanded its investment on other grain coops becoming one of the strongest grain controllers and processors in

Canada with a market share of over 40% of the Canadian grain industry. When these merger took place, ADM already owned some share of the grain business and infrastructure in Canada, ADM, ConAgra Inc. and Cargill Inc. also controlled about 80% of the North American flour business (http://ats-sea.agr.ca; http://www.agr.gc.ca).

Among all companies involved in the grain handling industry, there are in Canada five major players in the industry, only two of them are fully "Canadian" and only one still a Co-operative (Table 3-4). The presence of foreign capital in this industry is not only driving co-ops out of business and taking the grain industry control out of "Canadian hands", it is also concentrating the control of the world grain market in a few firms.

Table 3-4 Top companies in the Canadian grain handling business

Enterprises	*Ownership type*	*Country of origin*
Agricore United Ltd.	Private/ Joint Venture	Canada/U.S.
Saskatchewan Wheat Pool	Co-op	Canada
Cargill, Inc.	Private/Wholly owned Sub.	U.S.
Louis Dreyfus Canada Ltd.	Private/Wholly owned sub.	France
Maple Leaf Food Ltd.	Private	Canada

3.6 Profile of the Canadian oilseeds processing industry

The Canadian oilseed sector is divided into three components:

- Seed production.- Which includes farm production and farm storage
- Processing.- Engaged with crushing, refining and further processing for the production of oils, protein meals and finishing products.
- Marketing.- Covering trade, distribution, exporting and hedging of oilseeds and their products.

Given that the focus of this research is on industries related to the processing sector, only further details in this component will be provided.

The oilseed industry in Canada existed prior to World War II, and it was greatly benefited from the increase in demand for edible and industrial vegetable oils. The industry was integrated by small facilities mainly built during the 1930's which have been replaced by fewer and larger plants. These plants take advantage of the economies of scale that their larger capacity and modern equipment. Currently, must Canadian crushing plants are either relatively new or have been recently modernized, expanded and renewed. They incorporate the latest energy and labor

saving technology as well as more efficient oil extraction methods. The oilseed processing industry in Canada currently consists of nine plants owned by four companies (Table 3-5) which receive and crush oilseeds to obtain crude and crude degummed vegetable oils (from canola, soybeans, sunflower seeds and flaxseed) as well as protein meals for animal feed. Annual crush capacity is between 4.5 and 5 million tonnes of canola, 2 million tonnes of soybeans, .5 million tonnes of sunflower seed and 1 million tones of flaxseed (Umbach, 1999).

Table 3-5 Oilseeds processing plants in Canada

	Canola	Soybeans	Sunflower	Flaxseed
ADM Agri-industries Ltd.				
Windsor Ont.	X	X	X	X
Lloydminster, Ab.	X			
CanAmera Foods	X	X		
Hamilton, Ont.	X		X	X
Altona, Mb.	X			X
Harrowby, Mb.	X			
Nipawin, Sk.	X			
Fort Saskatchewan, Ab.	X			
Canbra Foods Ltd.				
Lethbridge, Ab.	X			
Cargill, Ltd.				
Clavet, Sk.	X			

The two major oilseeds processed in Canada are canola and soybeans, plus considerable smaller amounts of sunflower seed and flaxseed. In 1997, canola crushing accounted for 62% of total oil crushing, with soybean crushing accounting for 34%. During the same year, Canadian oilseeds crushing were 4.6 million tonnes accounting for 9% of total world rapeseed/canola crushing, compared with 7% for flaxseed, 1% for soybeans and less than 1% for sunflower seed.

Canada is also a net exporter of vegetable oils, in 1997 total vegetable oil production was 1.6 million tonnes of which 1 million were exported accounting for 43% of total world rape/seed canola oil exports, compared with 10% for linseed oil exports and less than 1% for soybean and sunflower oil exports.

The oilseed crushing industry makes an important contribution to the Canadian economy, the value of the processing industry as a domestic market outlet for producers was approximately $1.5 billion in 1997 and the value added benefit of the crushing industry was estimated to be over $230 million in the same year. In addition, the amount of crude canola, soybean and sunflower oils which were refined in Canada during 1997 contributed with over $350 million to the

processing industry. It is estimated that for 1997 the total value-added benefit of crushing and refining was approximately $600 million (Umbach, 1999).

Table 3-6 Refining oil plants in Canada

ADM Agri-Industries Ltd.
Windsor, Ontario
Lloydminster, Alberta
Canada Starch Company Inc.
Cardinal, Ontario
CanAmera Foods
Montreal, Quebec
Toronto, Ontario
Altona, Manitoba
Nipawin, Saskatchewan
Wainwright, Alberta
Gainers Inc.
Edmonton, Alberta
Monarch Fine Foods
Rexdale, Ontario
J.M. Schneider Inc.
Kitchener, Ontario.

Several organizations are involved in the production, research & development activities, marketing and promotion of the oilseed industry:

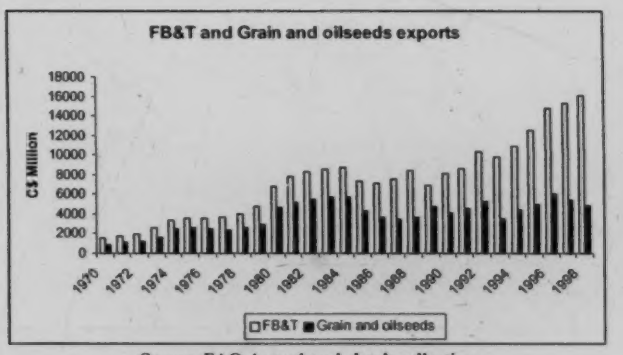
- The Canola Council of Canada (CCC).- Is a non profit industry organization that represent the common interest of all participants of the Canadian canola industry including growers, domestic crushers and exporters as well as some end users. The CCC promotes the use and awareness of canola and its value added products.
- The Ontario Soybean Growers Marketing Board (OSGMB).- Represents around 30,000 producers and negotiates certain aspects of the pricing arrangements for Ontario soybeans, while the handling, crushing and exporting are handled by private companies. It's objective is "to enhance the marketing of Ontario beans" by licensing producers, dealers and grain merchandisers and brokers as well as by establishing license fees and negotiating with dealers and handlers charges for handling, cleaning and drying.
- The Flax Council of Canada (FCC). - Represents the producers, grain handlers, shippers, exporters and end users of flax. The FCC promotes the advancement of flax and flax products.

- The Canadian Oilseed Processors Association (COPA).-Is a non profit industry association which represents all of the oilseed processing companies in Canada. COPA members include: ADM Agri-industries Ltd., CanAmera Foods, Canbra Foods Ltd., and Cargill Grain Ltd. Its objectives is to promote the processing oilseed industry in Canada, to provide a forum for the discussion and study of matters pertaining to this industry, to make recommendations to the government bodies and authorities on all matters pertaining to this industry, among others.

Different agencies of the Federal government also play an important roll in the development of this industry. The government usually coordinated through Agriculture Canada all efforts oriented to R&D activities (National Research Council of Canada, the Plant Biotechnology Institute, etc.). While the grade standards for grains and oilseeds are set and monitored by the Canadian Grain Commission, the Canadian General Standards Board, the Canadian Food Inspection Agency and Health Canada (Umbach, 1999).

3.7 International Trade in the Canadian Grain and Oilseed Industrial Sector.

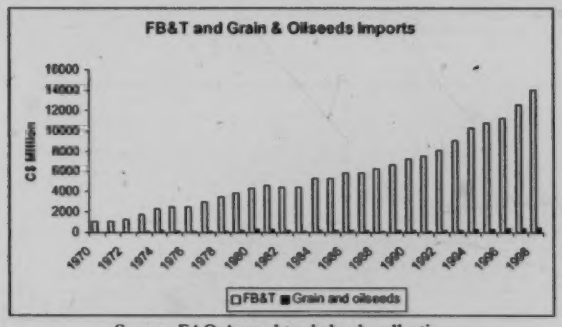
The Canadian grain and oilseed industrial sector is characterized for being (with dairy and poultry) a highly regulated sector. However the principal difference between the dairy and grain sectors is the market target for which the regulations have been created. As discussed previously, the regulatory environment was mainly oriented to protect domestic prices and market stability however the supply management system did not provide incentives for international trade, while the single desk marketing system represented by the Canadian Wheat Board allow it to have enough market power in the international arena. The grain sector has been historically an active international exporter and accounts for a significant share of all the FB&T industry exports (Figure 3-5). This export oriented sector is well positioned internationally. Canada is the world's largest exporter of durum wheat and oats and the second largest exporter of wheat, barley and malting barley.



Source: FAO Annual trade book collection

Figure 3-5 FB&T and grain and oilseeds exports

However after joining the free trade agreements first with U.S. and then with Mexico, and after ratifying the GATT agreements in agriculture, the Canadian grain and oilseed industry faced opposition of trading partners to what is considered government intervention in grain and oilseed international trade (the CWB is considered a state enterprise under the GATT agreements).



Source: FAO Annual trade book collection

Figure 3-6 FB&T and grain and oilseeds imports

The international trade disputes in this sector are of a different nature than the ones in the dairy industry. Given the export orientation of this industry, it is Canada who is challenging the U.S. and the E.U. under the WTO agreements to decrease the amount of support to their agricultural industry (both U.S. and the E.U. have export enhancement programs and subsidies) that undermine Canada's opportunities to enhance it's international market and mainly to obtain better prices for Canadian grains and oilseeds.

As well as with the dairy sector, the grain and oilseed sector consolidation process was accelerated with the increasing presence of multinationals. Over 60% of today's grain industry is controlled by a two firms (Agricore United Ltd. and Saskatchewan Wheat Pool), an estimation suggest that Agricore United controls over 40% of the Canadian grain industry while the

Saskatechewan Wheat Pool controls over 20%. Agricore United is the result of a merger of three Canadian Co-ops (UGG, AWP and MPE) with Archer Daniels Midland which is a U.S. grain MNE. Participation of MNEs in this sector is not a new issue, Cargill, a U.S. MNE has had a presence in Canada since the early 80's, by that time, this industry already showed symptoms of been highly consolidated. As an example, during the period of 1985-1990 over 70% of the primary grain elevators in Canada were controlled by 5 main firms (Appendix C) however, the industry became even more consolidated during the mid 90's when ADM merged with UGG, after this merge a series of mergers and acquisitions have been taking place in the sector up to the point where two firms control the majority of the grain and oilseed sector. The inflow of foreign capital and firms has dramatically changed the ownership structure in this sector, therefore, it is of interest in this research to evaluate the impacts derived of foreign investment (and consequently, industry consolidation) in the grain and oilseed industrial sector. Special interest is placed on FDI effects on productivity levels as well as the industry export performance.

3.8 The Crow Nest Agreement, the Western Grain Transportation Act (WGTA), and changes in the regulations of elevator tariffs.

The WTGA was based on the idea of enhancing Western Canada agricultural activities to enhance exports of Canadian products. This process was initiated and based on a 1897 Crows Nest Pass Agreement between the Canadian federal government and the Canadian Pacific Railway (CPR) As a part of the agreement, the government would give the railway a subsidy of $34 millions to build a rail line from Lethbridge, Alberta through the Crows Nest Pass to Nelson, British Columbia. In exchange the CPR agreed to haul the major grains destined for export to the port of Thunder Bay in the great lakes region at reduced freight rates. It was agreed that the rates would be fixed in perpetuity.

The railway act of 1925 made the freight rates, commonly known as the "Crow rates", statutory and applicable to the Canadian National Railway as well. The objectives were to integrate economically the Canadian west into the rest of the economy and provide inexpensive food for the population of Central Canada while increasing the demand for raw products produced in Western Canada. Even though the statutory rates were initially designed to provide incentive for growth and development, they were accused of the opposite.

Table 3-7 Grain and oilseeds sector policies and trade events

	GRAIN AND OILSEEDS SECTOR POLICY AND TRADE EVENTS
1976	Domestic Feed Grain Policy was introduced by the Federal Government. Under this policy, the CWB is required to supply feed grains to the domestic market in times of shortage at prices established by a "corn-competitive formula".
1977	The CWB started a market development program oriented to identify new markets for Prairie grains (wheat and barley). The CWB increased the contract program of specific wheat and barley varieties because of higher international demand and decreased or cancelled contracts including varieties with low international demand.
1978	Canadian grain exports decreased 1.8 millions as a consequence of a drop of (nearly 80%) of Ontario's wheat exports linked with work slow downs, strikes, bad weather causing a delay in the navigation opening season at Thunder Bay.
1980	U.S. embargo on grain shipments to Russia is imposed affecting Canadian grain exports and grain prices. Canada invested heavily to improve grain transportation capacity.
1981	U.S. embargo of grain shipments to Russia was partially removed. For the first time the "Domestic Feed Grain Policy" was required, however domestic prices were lower than international prices, affecting Canadian grain exports. Grain transportation capacity continued expanding, 4,000 hopper cars were added to the transportation system.
1982	the "Domestic Feed Grain Policy" was required, domestic prices were lower than international prices, affecting Canadian grain exports, however, the Federal Government started to compensate the CWB for the differences between domestic and international prices.
1983	Western Canada reaches a record 30.7 million tons of grain and grain products exports; however international prices were low as a consequence of the heavy export subsidy policy implemented in the U.S.
1984	A severe draught in Western Canada caused a decrease of 10 million tons of grain exports. The CWB made available feed grains through the "Domestic Feed Grain Policy", however when the competitive prices fall under the international and local open market prices, grain sales were suspended.
1988	U.S. continues implementing its export subsidy program for grain and grain products, U.S. also targets Russia and China to be included in its export enhancement program.
1989	A severe drought in Western Canada and part of U.S. affected world grain supply and grain prices. Russia's consumption of Canadian grain decreased, this behavior was attributed to U.S. export enhancement program which included Russian and China since 1987.
1990	International grain and oilseed prices were affected by larger volumes of product traded at subsidized prices from the U.S. and the E.C. Export subsidies increased considerable as competition intensified and international grain prices decreased.
1991	International prices of grains and oilseeds collapsed as a result of record crops worldwide and the "export subsidy battle" between the U.S. and the E.U.
1994	U.S. placed a special tariff and quota limit on Canadian wheat exports to U.S. (Under an international trade commission investigation). NAFTA came into effect; it expands Canadian potential export market.
1995	GATT agreement in agriculture takes place (signed in Dec, 15, 1993). It outlines reductions of export subsidies and domestic support, eliminates non-tariff barriers and provides minimum market access commitments. The Western Grain Transportation Act came to an end on August 1. The export subsidy trade war between US and the EU came to an end (however other kind of subsidies still remain in both sides such as the export enhancement program in U.S. and deficiency payment program at the E.U.). The Canadian Grain Commission stopped regulating elevators tariffs.
1997	The already heavily consolidated grain and oilseeds industry takes a further step to consolidation with the merge of UGG and ADM. (up to this date 4 enterprises controlled over 60% of the Canadian grain and oilseed industry, Saskatchewan Wheat Pool, UGG, Manitoba Pool Elevators and Alberta Wheat Pool).
1998	Alberta Wheat Pool and Manitoba Pool Elevators merge to form Agricore Ltd.
2001	A merger between Agricore and United Grain Growers reflects a constant movement to consolidation of the Canadian Grain Industry. (Agricore United Ltd. Is expected to control around 40% of the Canadian grain and oilseed industry).
2002	The SWP falls into a deep financial crisis.
2003	The SWP sales assets (grain elevators infrastructures) to Agricore United Ltd.

Only the grain industry was being developed due to the low freight rates. During the 1960's and 1970's, the railways increasingly felt the effects of fixed rates with their rising costs. There was little incentive and no funds to maintain or upgrade the transportation system. Railways responded to the problem by abandoning high cost branch lines and did not expand or upgrade their equipment base in an attempt to reduce their losses.

Not only did the Canadian government find little or no crop diversification on the western prairies, they also say shrinking rail system servicing those prairies, producers were also finding increasing difficulties to export, deriving in the Canadian government stepping in to pay for branch line maintenance and by purchasing railway cars. The rationalization process was slowed dramatically during the 1970's and early 1980's due to a series of branch line abandonment prohibition orders issued by the Canadian governor in council between 1974-1984. During the same period, there was also a consolidation of the elevator system taking place and this process still continues to date.

Fixed rail rates coupled with rationalization constraints were adversely affecting the Canadian rail transportation system while government costs of branch line maintenance were increasing. Canadian industries and railways were pressuring for policy changes to the Crow agreement. In response, the Canadian government passed the WGTA in November 1983, becoming effective in November 1, 1984. The WGTA was designed to further western diversification while correcting some "drawbacks" contained in the original Crow Nest Agreement.

To accomplish this further diversification, the WGTA expanded the number of commodities eligible for export subsidy. The core of the act was basically designed to relieve revenue losses suffered by the railways under the crow agreement due to increasing costs while revenue from hauling grain remained fixed. The government basically pays the difference between the cost to the railways of transporting statutory crops and the sum of what the railways received from shippers moving statutory crops under the crow rate.

Payment of the subsidy is achieved through a fixed contribution by the government initially calculated at $658 million reached $906 million dollars (Klein 1991). The shipper was required to pay the full amount of any annual railway cost increase in grain rail transportation due to inflation up to 6%. Beyond 6%, the Canadian treasury would step in. The shipper continued to pay on average 35% of the total freight cost while the government pays the remaining 65% of the freight bill in moving product to export market or domestic eastern Canadian markets. An additional

aspect of the WGTA is the shipper share limitation provision. This provision limits the shipper share of the freight rate to 10% of the weighted average weighted price for grain.

The Canadian Grain Commission (CGC) regulates elevators and grain dealers requiring a bond against financial failure. It also regulates grain inspection and movement including sampling, grading, weighing, storing shipping, and up to 1995 the CGC also regulated elevator tariffs. In August 1995, a major change in elevator tariffs regulation took place by the amendment of the "Canada Grain Act" (under Bill C-51). Under this amendment, elevator tariffs were deregulated in order to provide producers with opportunities to shop around for the best elevator rates for grain handling, cleaning, storage, and drying. As a result of the Bill C-51, the CGC was no longer required to set grain elevators tariff maximums. Elevator companies were free to charge what they considered the "right" fee. Still elevator companies are required to tell the CGC what they are charging, elevator companies are allowed to charge less than the rates they post and filed with the CGC.

The deregulation of elevator tariffs took place in stages, during a one year transition period, the CGC had the authority to set tariff ceilings by order if it believed abuses were taking place. During and after the transition period, the CGC performed an arbitration role responding to complaints and seeking remedies. After the one year transition period, the Commission will still retain the authority to set maximum tariffs, by regulations if considered necessary.

3.9 Summary

This section provided an overview of the Canadian dairy and grain industrial sectors and high lighted the fact that the control of both industries is concentrated in a small number of firms. The regulatory policy governing both industrial sectors was also approached with the purpose of illustrating that even though both sectors are considered part of the Food & Beverage & Tobacco sub industry (under the manufacturing industry), these particular policies and the sector concentration suggest that the impact of any taken "action" on the manufacturing industry won't have the same effect on these industrial sectors.

The new international trade agreements have motivated a series of policy changes for both sectors, in the case of the supply management regulations in the dairy sector, there have been changes like switching import controls from quota protection to tariff protection, the elimination of a dairy production subsidy as well as the creation of pooling agreements that have allow the industry to become more active in the international trade arena. The scenario for the single desk

selling structure represented by the CWB is not much different, the grain transportation subsidy was eliminated in 1995, and the free trade agreements seems to represent more trade opportunities for this sector, however the challenge to compete against highly subsidized agriculture and export promotion programs in place by the Canadian main competitors still remains. The fact that both sectors have similar policy regulations with different trade orientations raises questions about the interest lying behind the increasing levels of FDI and furthermore the increasing levels of foreign control in both Canadian sectors. It might be too early to accurately explain the reasons why foreigners are eagerly investing in such regulated sectors, the vision of what is to come if the WTO rules are implemented in Canada could explain this tendency, however what we can evaluate is the positive or negative effects derived for both sub sectors from foreign capital inflows.

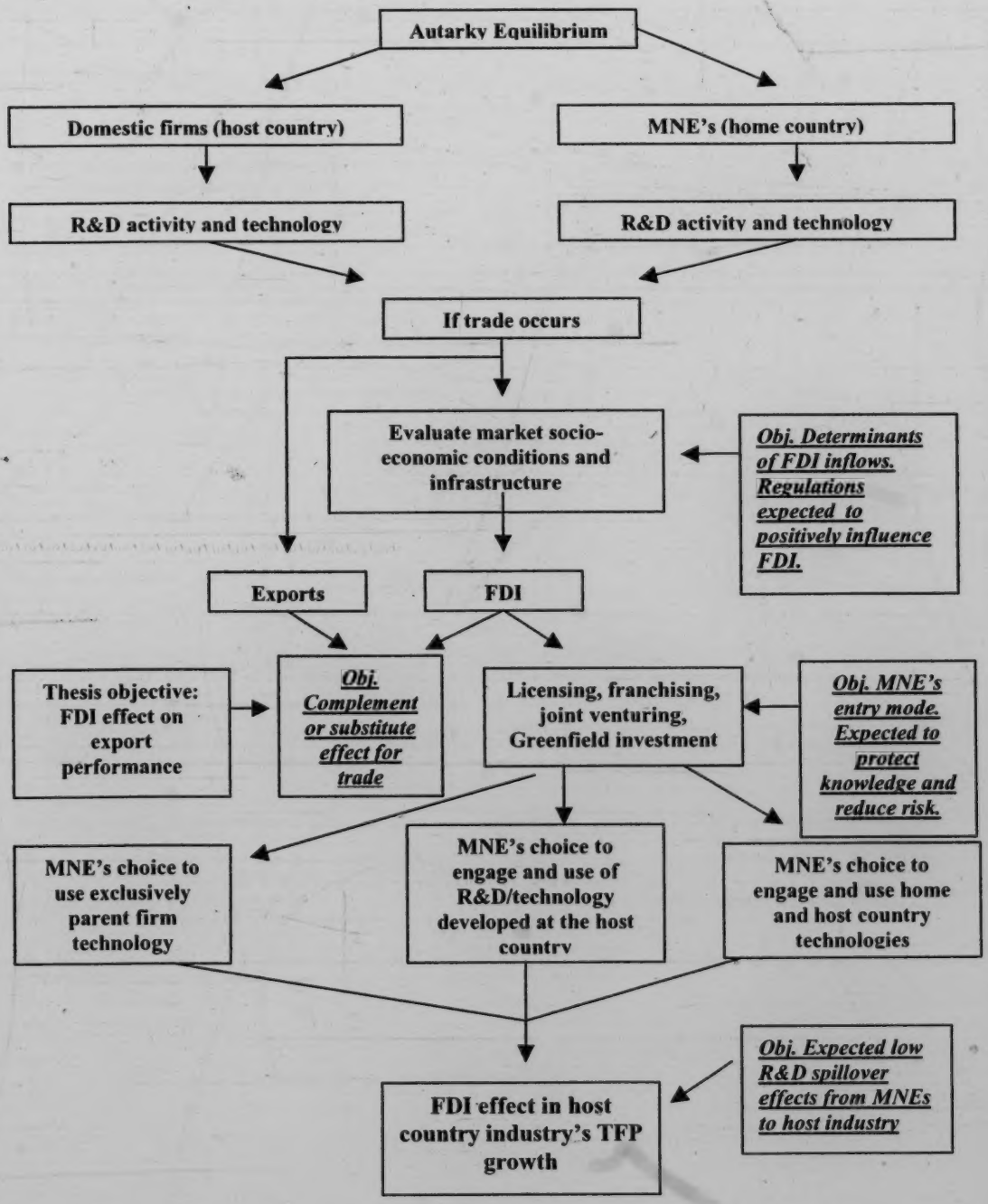
Previous research has omitted the evaluation of sector specific regulations, specifically its effect on attracting FDI inflows or the effects of FDI on them given the regulatory environment governing them. This thesis investigates FDI behavior in highly regulated FB&T sectors (dairy, and grain and oilseeds) given that these sectors have lately experienced increasing trends on their share of foreign ownership. The fact that over 50% of the grain and oilseed sector as well as the dairy sector are controlled by a few firms has lead us to emphasize the importance of disaggregating this analysis from an industrial level of aggregation down to a sector level of aggregation. However given the high level of consolidation in both targeted sectors, the question about the possibility of performing the analysis at a firm level arises. Our previous discussion and illustrations has allowed us to realize that the accuracy of any analysis "sharpens" as it is performed in more detail. The consolidation pattern in both sectors is clearly illustrated in the annex tables (AG and AH), this trend have been especially active since the early 90's and there is nothing that could suggest that the process of mergers and acquisitions could have a sudden end. Therefore if this analysis were to be done at a firm level, the results could reflect more accurate results with regards to the effects of FDI in the firm and in the sector export performance, as well as on TFP growth. The analysis will also show what specific attributes does the multinational firms included in the analysis look after to take the decision to foreign direct invest in an specific economy and/or sector and how their performance is influenced by their choice of entry mode.

Figure (3-14) has the purpose of illustrating the spillover process and the main points of interest for this empirical analysis. The illustration assumes that under autarky both domestic and foreign firms are engaged in technology development activities, which eventually would become a

competitive advantage for firms involved in R&D. Those technologies are often used by firms to enter a new market through exports, which are a low risk mode for market entrance. However, as trade occurs and exporters identify new market or process advantages that can be exploitd by them, the alternative to foreign invest arises. The theory of the firm argument with respect to diminishing returns to investments suggests the possibility for a firm to establish production facilities abroad [if host country competitive advantages are identified and can be exploitd in addition to the firm competitive advantages (Eclectic theory of the MNE)].

FDI is the origin of encountered perceptions; by one side when MNEs invest in a host country is because they already have identified domestic advantages that could be exploited, however they are not willing to allow the host industry to exploit theirs because that would mean loosing competitiveness against the host industry. Foreign firms won't risk their capital without performing a detailed evaluation of the host economy socio economic conditions, especially those related to property rights. The protection of their tangible and intangible assets will then rest not only in the host country policies, but also in the elected choice of market entrance. Meanwhile expectations of the host economy are of obtaining technological spillovers derived from the MNEs activities in order to increase productivity growth (and therefore domestic living standards). The host economies can also achieve the incorporation of foreign technology using licensing and franchising, however literature has identified these alternatives as the reason of decreasing domestic R&D activities given the ease to pay for knowledge (Djik, 2000). Therefore FDI is perceived as the "most efficient" way to incorporate foreign technology with out affecting domestic R&D activities. In order to be able to attract FDI, the host economy engages in providing adequate conditions that would be perceived as attractive for MNEs (determinants of FDI). Most FDI transactions in the Canadian FB&T sub industry have been done by acquisition of existing firms and by joint ventures. Previously revised literature identified risk and the protection of proprietary knowledge as the main considerations by a MNE for electing the entry mode. Our project will attempt to prove that MNEs with "greater competitive advantages"(efficiency, profitability, assets, etc.) are "jealous" with regards to spilling their competitive advantages to the domestic industry. Our expectations are of MNEs to elect entering by acquisitions than by joint venturing, given that their competitive advantages are such that would allow them to reduce the risk factor embedded in entering a market by acquisition. The way MNEs are affecting trade of Canadian agri-food products have also become a concern.

Figure 3-7 FDI process and thesis objective


Autarky Equilibrium
Domestic firms (host country)
MNE's (home country)
R&D activity and technology
R&D activity and technology
If trade occurs
Evaluate market socio-economic conditions and infrastructure
Obj. Determinants of FDI inflows. Regulations expected to positively influence FDI.
Exports
FDI
Thesis objective: FDI effect on export performance
Obj. Complement or substitute effect for trade
Licensing, franchising, joint venturing, Greenfield investment
Obj. MNE's entry mode. Expected to protect knowledge and reduce risk.
MNE's choice to use exclusively parent firm technology
MNE's choice to engage and use of R&D/technology developed at the host country
MNE's choice to engage and use home and host country technologies
Obj. Expected low R&D spillover effects from MNEs to host industry
FDI effect in host country industry's TFP growth

Previously reviewed literature observed that when FDI's target is market seeking, the FDI becomes a substitute for exports. However, when it is resource seeking, it becomes complementary to exports. By disaggregating our analysis we are expecting to be able to identify these relations in a more accurate way than if performing the analysis for the entire FB&T sub industry. Our expectations are of a complementary effect of FDI for the FB&T sub industry, while an export substitution effect is expected for the dairy manufacturing sector given the orientation of the regulatory environment governing both sectors.

Ones MNEs have established in the host economy, they face three choices for technological incorporation in their process: a) they have the choice to use exclusively home country technology, b) They can develop their own technology in the home country, and c) can use a mix of both, domestically and foreign produced technology. It is through the MNEs operations that eventually the host economy is expecting to capture foreign technology spillovers. However, based on the theory of the firm, this research questions the contribution of FDI towards productivity growth in every component of the FB&T sub industry, especially in highly regulated sectors. It is our beliefe that foreign contributions to TFP growth are not derived exclusively from foreign R&D spillovers but also by additional factors such as increased competition, and technology imports derived from open border policies.

Chapter 4 MODEL DESCRIPTION AND RESULTS

Introduction

Based on the literature review discussed in chapter two as well as the description of the industries involved in this study in chapter three, we will describe the models and proxies that will allow us to test for the effects of FDI on export performance, for the effects of FDI on productivity growth, as well as for the determinants of inward FDI and the choice of entry mode. The variables are selected based on the main variables used by other authors who are supported in previous empirical work. An important feature in this chapter is the introduction of "granger causality" which will allow us to test for the directional relationships of the variables in the models, i.e. if foreign investment is a consequence of the host country available resources and infrastructure, if the available resources and infrastructure are a consequence of FDI (unidirectional granger causality) or if there is a bi-directional granger causality. If a bi-directional causal relation or a causal relation from X to Y were to be found, this would imply having to perform further analysis by relocating the variables in our equations.

4.1 Testing for unit root and causality.

The empirical works reviewed in previous chapters assume unidirectional causality when evaluating for the effects of FDI on exports and imports as well as when evaluating for FDI technological spillover effects on TFP growth; the same as when evaluating for the main determinants of inward FDI. It is important in this research to determine if there is a unidirectional, bidirectional or independent causal relationship between the dependent and independent variables when specifying models for the objectives of this work.

As a part of the cointegration analysis, we will test for the finding of a unit root in a time series. Testing for unit roots indicates nonstationarity which has implications for economic theory and modeling. Results from regressions will not be meaningful if the variables are not stationary, that is, if they possess time trend. Nonstationary data may lead to cointegrating relationships, a series Y_t is said to be integrated of order denoted by Y~I(d) if it becomes stationary after differencing d times and thus Y_t contains d unit roots. A series which is I(0) is said to be stationary. To determine whether a series is stationary or non-stationary, unit root test must be carried out. The study adopts the Augmented Dickey Fuller (ADF) Unit Root Test for unit root testing. If the series is not stationary in levels, a further test will be carried out on their first differences (Hall and Cummings, 1999). For a time series Y_t the regression equation is given as:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-i} + \varepsilon_t, \quad (1)$$

Where, Δ refers to the first difference of variable Y, p is the number of lagged terms which are chosen to ensure that the errors are uncorrelated and ε_t for t = 1,.....,N is assumed to be white noise. In (1), the null hypothesis that $\alpha_1 = 0$ against the alternative hypothesis $\alpha_1 \neq 0$ is tested. The ADF is implemented as rejecting the null hypothesis of a unit root (non-stationary) if the t-ratio is smaller than the critical value. In this case the level of time series Y_t is characterized as integrated of order zero, i.e. I(0). If it is found that the individual time series in equation (1) are stationary after the first difference, then the series is characterized as integrated of order one, I(1). The next step is to examine the cointegration relationship among the series. The cointegration test determines whether there exists a long run equilibrium relationship between two or more different variables over time (Gujarati, 1995). If variables are cointegrated, then it can be interpreted as the variables are "stationary" relative to each other implying that the differences between the two values fluctuate around a fixed value. In other words if two series are cointegrated, short run deviations are possible, but market forces ensure that equilibrium is regained in the long run. Like the unit root tests, there are several approaches to testing for cointegration. The Engle Granger Cointegration test regresses one variable on a single variable and the equation is given as:

$$y_t = \alpha + \beta x_t + \mu_t, \quad (2)$$

Where $\mu_t \sim (0, \sigma^2)$ is stationary if the variables y_t and x_t obey a stable long run relationship (are cointegrated). The cointegration tests support cointegration if the test statistics are smaller than the critical values. C.W.J. Granger developed a causality analysis oriented to test times series models, one question concerning model specification is whether one variable is causally related to another. Granger (1969) addressed this question by introducing the concept of causality that has become known as "Granger" causality.

His idea is based on the fact that "the future cannot cause the present or the past". He argued that autocorrelation problems with the variables arise when using time series data, making difficult the process of determining the direction of causality. Granger's causality analysis contribution is that it can distinguish whether the variables are temporally related and if the inclusion of a particular variable in the model could reduce the variance with respect to given information set (Brown, 1991; Darnell, 1994). Under Granger's assumption (future cannot cause the present or the past)

the author suggests testing whether lagged values of a specific independent variable Xt play a significant role in explaining Yt as the dependent variable.

$$Y_t = \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \alpha_3 Y_{t-3} + ... + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} ..... + \varepsilon_{1t} \quad (3\text{-}1)$$

$$X_t = \vartheta_1 Y_{t-1} + \vartheta_2 Y_{t-2} + \vartheta_3 Y_{t-3} + ... + \vartheta_1 X_{t-1} + \vartheta_2 X_{t-2} + \vartheta_3 X_{t-3} .... + \varepsilon_{2t} \quad (3\text{-}2)$$

If this is the case, it is said that X "Granger causes" Y (unidirectional causality). However it is also possible to find bidirectional causality (price causes quantity demanded but quantity demanded also causes price) and independence between X and Y (Brown, 1991; Darnell, 1994). Sarker (1995) described the causality tests developed by Sims and Haugh-Pierce. However both of them seem to have some drawbacks with regards to autocorrelation problems that can bias the results of the analysis and he proposed an alternative estimation method that will be used in this analysis.

Sims (1972) work emphasized the importance of assuming serially uncorrelated residuals. Therefore all variables to be used in the regressions should be measured as natural logs and prefiltered using the filter $1\text{-}1.5L+.5625L^2$; i.e., each logged variable x(t) should be replaced by x(t)-1.5x(t-1)+.5625x(t-2). This filter was expected to "flatten" the spectral density of most economic time series in order to remove autocorrelation in the error structure (Sims, 1972). In assessing the effectiveness of the prefilter, Sims (1972) warns not to rely on Durbin Watson statistics because the correlation remaining after the application of the filter "would most likely be of an order greater than one". The alternative is to perform a general auto regression on the residuals. Findings statistically significant coefficients leads to the rejection of the null hypothesis of no autocorrelation.

The Haugh-Pierce test involves a two step procedure; the first step involves the estimation of an autoregressive integrated moving average (ARIMA) model for each variable. The residuals from the first step are used to estimate cross-correlation functions in the second stage. The test of causality between Y and X is based on the significance of these cross-correlations; however Sarker (1995) argues that these causality tests have generated inconsistent causal conclusions in empirical applications. Literature related to the effects of FDI on host economies and/or industries generally assumes that there is a unidirectional causal effect of FDI on different domestic variables. Going further, literature supports the fact that domestic economies engage in

controlling or improving domestic infrastructure, social stability, trading agreements and R&D activities among others in order to attract foreign capital. Are these enough "unidirectional causal" reasons for foreign investors to take the decision of where and when to invest in a specific economy? It might be that foreign investors see the opportunity to foreign invest given the amount of trading and investment that already exists in a particular economy. It is of the interest in this research to evaluate the causal relationship between the dependent variables and each of the independent variables in order to establish if all the effects in the domestic sectors follow a "reaction" of new foreign capital in these industries (unidirectional causal effect) or if the effects on TFP and trade performance are a response to an interaction of several existing conditions in the domestic industry (bidirectional causality). Following Sarker's (1995) procedure to test for causality, the model is developed in various stages. First we have to determine whether the series has unit roots; then, cointegration tests are performed and if causal relationships are detected in the data, it implies a long run stable relationship between the variables (Granger causal relations (Sarker, 1995)).

4.2 Testing for the determinants of FDI

Ordinary least squares (OLS) will be used in order to test for the determinants of FDI. OLS analyzes the linear relationship that exists between a dependent variable and the independent variables and it is intended to minimize the sum of the squared differences (or errors). However, the use of OLS implies the adoption of some assumptions; mainly the population regression function should be both linear in variables and parameters. This assumption is not a sufficient condition to ensure that there is a precise statistical relationship between the estimators and the "true" corresponding values. There is a basic set of assumptions that are comprised in the classical regression model that will give us the certainty of obtaining unbiased estimates:

- Normality.- Y values are normally distributed for each X, probability distribution of error is normal.
- Homoscedasticity (constant variance).
- Independence of errors.
- Linearity (relationships between variables is a linear function).

When using OLS, if the previous assumptions are met, it can be implied that the OLS method will produce BLUE (best linear unbiased estimates) and would be consistent with the Gauss-Markow theorem which states that "given the assumptions of the classical linear regression model, the

least-squares estimates, in the class of unbiased linear estimates, have minimum variance, that is, they are BLUE" (Gujarati, 1995). The coefficient of determination R^2 is the portion of the total variation in the dependent variable that is explained by its relationship with the independent variable. One way of choosing between competing models is to choose the one with the highest R^2 because this model will have higher "explanatory power", however when using different number of regressors is not valid because by increasing the number of regressors increase the value of the R^2. In this case we have to look at the adjusted R^2 which does not always increases when adding an extra explanatory variable. The adjusted R^2 is estimated by including the total sum of squares *SST* of the dependent variable "y" about its arithmetic mean, *SSEi* which is the sum of squared errors from the *i*th model, and *Ki* is the number of coefficients in the model:

$$\overline{R}_i^2 = 1 - ((SSE_i /(T - K_i)) / (SST /(T - 1))$$

The analysis will also use the t-test for hypothesis testing. Broadly speaking, this test is a procedure by which sample results are used to verify the truth or falsity of a null hypothesis. The decision to accept or reject the null hypothesis is made on the basis of the value of the test statistic obtained from the data. A statistic is said to be significant if the value of the test statistic lies in the "critical region" (the tails of the t distribution), in this case the null hypothesis would be rejected. However, if the test statistic value lies in the acceptance region, the test is said to be statistically insignificant (Gujarati, 1995).

Durbin Watson "d" statistic is often used to detect the presence of autocorrelation problems in the estimation; however the inclusion of the lagged dependent variable in the model causes some trouble in autocorrelation estimation in autoregressive models. Gujarati (1995) stated that Durbin-Watson "d" statistic should not be used to detect first order serial correlation in these kinds of models, because the computed "d" value generally tends towards 2, which is the value of "d" expected in a truly random sequence and by using this value we would "build" a bias against discovering first order serial correlation. The alternative solution proposed by Durbin himself is the use of the test called "h" statistic:

$$h = (1 - 1/2d)\sqrt{n/1 - n[\text{var}(\hat{\alpha}_2)]}$$

Where n= sample size, var $(\hat{\alpha}_2)$ = variance of the coefficient of the lagged Yt-1. The decision rule is that if H.1.96 or if h,-1.96 the null hypothesis must be rejected and conclude that there is no positive or negative first order autocorrelation.

Ramsey Reset test will be used to test for specification problems in the model. With this test, the squares of the predictions from a model are included as additional explanatory variables, and the model is re-estimated. Either a t-test or and F-test is used to test whether the coefficients of the prediction variables are singly, or collectively significantly different from zero. Significance of the coefficients is intended to be indicative of some kind of specification error such as omitted variables or incorrect functional form (Griffiths et. al. 1993).

The Chow test will be used to test for structural change for the period 1972-2001. Structural changes can be present due to important "trade reforms" that have been taken place during the late eighties and the mid nineties (CUSTA and WTO). In a general sense, the Chow test divides the sample of "n" observations into two groups. The first group will have n_1 observations and the second group will have n_2 observations, where $n_2 = n - n_1$. Then, each regression is estimated independently in order to compute the error sum of squared residuals for each sample group (ESS_1 and ESS_2). The unrestricted sum of squared residuals is the sum of the error sum of squared residuals from each sample ($ESS_U = ESS_1 + ESS_2$).
If the regression coefficients are the same before and after period n_1, the model should be re-estimated again but with the pooled sample (i.e. all together), and obtain the restricted error sum of squares (ESS_R). The test statistic is specified as follows:

$$F = \frac{(ESS_R - (ESS_1 - ESS_2))/ k}{(ESS_1 + ESS_2)/ (n - 2k)}$$

The test procedure is to reject the null hypothesis that there is no structural change if the calculated F statistic>$F_{k,n-2k}$(from the F-distribution tables).
(http://www.thecoo.edu/academic/business/economics/ECO460/ChowTest.html).

4.3 Selection of estimation for models explaining the effects of FDI on TFP growth, import and export performance.

For analysis intended to evaluate the effects of FDI on TFP growth, import and export performance we will use limited information maximum likelihood (LIML) estimation given that the variables of FDI will be used as instrumental variables as well as all the exogenous variables included in the other equations to be estimated. The reason for the use of instrumental variables is that FDI is contained in the other equations as an independent variable which could cause endogeneity problems if the trade (import and export) and TFP equations were estimated using ordinary least square (OLS). As a consequence of the endogenous explanatory variable some correlation problems with the disturbance term of the equation in which it appears as an explanatory variable could be present.

The literature contains several models in which one model is embedded in another, which produces "two step estimation problems" (Greene, 1997). Our model has FDI as an endogenous variable, and it will also be estimated as an independent variable in another regression analysis. Consider the following simple example borrowed from Greene (1997):

Model 1. Expected number of enterprises $= E[y_1 \mid x_1, \theta_1]$.

Model 2. Decision to enroll in R&D activities $= y_2$, a function of $(x_2, \theta_2, E[y_1 \mid x_1, \theta_1])$.

There are two parameter vectors $\theta_1 and \theta_2$, and note that the first appears in the second model, although not the reverse. There are two ways to proceed, the first one is by using full information maximum likelihood (FIML) estimation, which would involve forming the joint distribution $f(y_1, y_2 \mid x_1, x_2, \theta_1, \theta_2)$ of the two random variables and then maximizing the full log-likelihood function, $\ln J = \sum_{i=1}^{n} f(y_1, y_2 \mid x_1, x_2, \theta_1, \theta_2)$.

The second way is by using limited information maximum likelihood (LIML) procedure. For this kind of model (similar to the one used in our analysis) LIML can be used by estimating the parameters of model 1, since it does not involve θ_2, and then maximizing a conditional log-likelihood function using the estimates from step 1: $\ln \hat{J} = \sum_{i=1}^{n} f[y_{i2} \mid x_{i2}, \theta_{i2}, (x_{i1}, \hat{\theta}_1)]$.

Greene (1997) identifies three reasons for using LIML under the conditions explained as the second alternative method, the first one is that it could be relatively easy to estimate two log-likelihoods, but it would be complicated to derive the joint distribution. This situation arises when the two variables being modeled are from different kinds of populations, such as one discrete and one continuous. The second reason is that maximizing the joint log-likelihood may be numerically complicated. The third is that in the worst case scenario, if either model is mis-specified, then the FIML estimates of both models will be inconsistent. But if only the second is mis-specified, at least the first will be estimated consistently. An advantage of using LIML instead of a two stage least square (TSLS) is that the distribution of the LIML estimator generally approaches normality faster than the distribution of the TSLS estimator, due primarily to the bias of the latter (Oberhelman and Kadiyala, 1999).

4.4 Testing for the MNE's choice of entry mode

A binary logit model will be used to test for the effects of the choice of entry mode by MNE's into the Canadian agri-food industry. The logit model is a good alternative for analyzing models in which the dependent variable involves two or more discrete choices. There are three types of logit models: binary or multinomial logit model, conditional logit model and mixed logit model.

As mentioned, during our analysis for the MNE's choice of entry mode, we will deal with a binary logit model given that the dependent variable (Y) will take the value of 1 if the MNE choice of entry mode is by acquisition and the value of 0 if the choice of entry mode is by a joint venture. The reason for using in our analysis only acquisitions and joint venture as the MNEs choice of entry mode, is based on the fact that most FDI in the Canadian agri-food industry has taken place under these entry mode schemes (appendix AB and AC). Further details with regards to the model specification will be provided in the following section.

4.5 The model specifications

This section will describe the variables and proxies that are used in our analysis. It's important to stress the fact that all the evaluations will be done for three different components of the manufacturing industries, the food, beverage & tobacco (FB&T) sub industry, as well as the dairy, and grain & oilseed manufacturing sectors. Our first objective is to attempt to compare exactly the same variables that explain the models for the FB&T sub-industry versus the dairy,

and grain and oilseeds manufacturing sectors. This exercise will allow us to demonstrate that the same factors cannot fully explain individual industrial sectors performance and that they should be analyzed independently. Our second objective is to perform an analysis including sector specific variables that could help us better understand the effect of FDI on specific industrial components.

The inclusion of lagged dependent variables in our models has the objective of capturing the effect that past experiences have in present actions (lagged dependent variables will act as coefficient of expectations). Gujarati (1995) described this effect as the "hypothesis of adaptive expectations or error learning" implying that "economic agents will adapt their expectations in the light of past experiences and that in particular they will learn from their mistakes". In addition to the "error learning effect", lagged dependent variables are also used as "partial adjustment estimation", this rationalization was developed by Mark Nerlove and is based on the assumption that there is an equilibrium, optimal, or desired amount of capital stock needed to produce a given output under a given state of technology, interest rate, etc. The lagged dependent variable in this case would represent the actual change in capital stock, or investment, etc. that occurred in any given period of time, and the actual change must have a value between 0 and 1. Where a value of 0 would represent no change, a value between 0 and 1 would represent a "partial adjustment" and a value of 1 would represent that the actual stock of capital is equal to the desired stock. A third approach for the use of lagged dependent variables is to capture the "speed of adjustment" effect. This approach was developed by Koyck with the objective of estimating distributed lag models. A Koyck postulate is that each successive coefficient of increasing lagged dependent variables would be numerically smaller than each of the preceding coefficients. Implying that as one goes back into the distant past, the effect of that lag on Y becomes progressively smaller (Gujarati, 1995).

The addition of two trade dummy (and trade values) variables in our models is intended to capture the effects of the Canadian trade oriented policies and the impact that the "open border " policy has on FDI inflows, trade and productivity growth. The objective of evaluating the effects of the Custa/Nafta agreements, as well as the WTO agreement obeys the fact that Canada's major trading partner is U.S. as well as the G7 countries. The use of specific country trade values could have been used, however the objectives of our research is to evaluate the effects of trade agreements (overall) as well as some industry specific characteristics on FDI inflows, trade, and

productivity growth. A country specific detailed analysis is a recommendation for further research.

4.5.1 Determinants of FDI in the Canadian agri-food industry

Literature suggests that during the last two decades countries have been promoting inward FDI through a set of policies and tax benefits, because of an expected trade off between this "loss of income" and FDI which is expected to promote a set of benefits for the host industry and economy. However tax incentives are not the single motivation for foreign investors to risk their capital in a specific geographical region. The analysis in this section attempts to evaluate a set of variables that are believed to influence the decision to foreign direct invest in the Canadian FB&T industry as well as in the Canadian dairy and grain & oilseeds manufacturing industries. Extensive research has been done to test for FDI determinants, Walkenhorst (2001), Chakrabarti (2001), Billington (1999), Head et. al. (1998) among others, considered as explanatory variables the size of the industry, government intervention (subsidies and trade barriers), interest rates, unionization rates, corporate taxes, openness to trade, etc. to illustrate some of the variables that are considered by MNEs prior to investing in an specific country and/or industry. In addition, given the government position towards regulating some of the FB&T industries, the variables to be included in this analysis will include literature cited variables, as well as country and industry specific variables that could better illustrate the dependence of FDI inflows on industry or sector specific environment.

Overall, the model is specified as follows:

$$FDI_{jt} = \alpha_0 + \alpha_1 Sector_{jt} + \alpha_2 Int.Rate + \alpha_3 FDI_{(t-1)} + \alpha_4 Tariff_{jt} + \alpha_5 Subsidies_{jt} + \alpha_6 Custa + \alpha_7 WTO + \alpha_8 Fuel + \alpha_9 Labour + \alpha_{10} Taxes + \alpha_{11} Union + \alpha_{12} \mathrm{Re}\, gul + \alpha_{13} Input\, \mathrm{cos}\, t + \varepsilon$$

Where:

- FDI_{jt} Stands for present values of inward FDI in industry j in time t.
- $Sector_{jt}$ Stands for sector size in industry j at time t (contribution of industry j to national GDP). An industry that contributes substantially to the national economy might suggest the presence of competitive advantages in the host country.

- GDP_{jt} Stands for economy size, it is expected that larger economies would attract higher levels of FDI.
- Int. Rate Is a proxy that stands for weighted difference in interest rates between Canada and its main trade partners (G7). It is intended to reflect the differences in cost of capital.

  The weights are built as follows:

  wus = (U.S. FDI in Canadian FB&T industry / Total FDI in the FB&T industry), where "wus" stands for the weighted value of U.S. FDI in the industry.

  wr =(row* FDI in Canadian FB&T industry / Total FDI in the FB&T industry), where wr is the weighted value of row FDI in the industry.

  $wusir = wus$ (U.S.A. interest rate), where "wusir" stands for the weighted U.S.A. interest rate.

  $wrir = wr$ (average row interest rate), where "wrir" stands for the weighted row interest rate.

  $awir = (wusir + wrir)/2$, awir stands for weighted average world interest rate.

  Then *Int. Rt.=(Canadian interest rate – awir).*
- $FDI_{j\,t-1}$ Is the lagged value of FDI in industry $_j$. It is intended to capture the cumulative effect of past experiences.
- $Tariff_{jt}$ Is a proxy that stands for the weighted average of existing import tariffs for industry $_j$. A correlation analysis among products of different groups of the FB&T industry showed that changes in import tariffs among products of the same group were correlated, therefore a single product of the most representative groups (wheat flour, fresh cheese, bovine carcass and frozen mixed vegetables) were elected to represent the groups of grain, dairy, meat and fruit & vegetables manufactured products that would allow us to build the weighted average import tariff as follows:

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* row, stands for "rest of the world"

$w_j = (value\_added_j / \sum Value\_added_j)$, where w_{jt} is the weighted value added of industry group j.

$tw_j = w_j(import\_tariff_j)$, where tw_j is the weighted import tariff of industry group j, then $Tariff_{jt} = (\sum tw_j / \sum w_j)$.

- Subsidies $_{jt}$ Stands for subsidies, reflects the ability of firms to obtain raw materials at a lower cost. Specifically, this variable is intended to illustrate the effect of subsidies on dairy production, grain transportation and R&D investments under the Matching Investment Initiative (MII) discussed in the previous chapter.
- Regul $_j$ Regul stands for the regulatory environment governing industry $_j$ (supply management or Canadian wheat board), therefore, this variable will only be included in the analysis for the dairy and grain & oilseeds industry. For the dairy manufacturing industry. This variable will include production quota values (expressed in kg butterfat), while for the grain & oilseeds industry the variable will illustrate the grain elevator tariffs in place while they were regulated by the CGC.
- Union Stands for unionization rate. It is described as the percentage of workers in the industry which belong to a labor union.
- Input cost This variable is intended to capture the effect of the cost of the main input cost for the industrial sector under analysis. For the dairy industry, the annual value of industrial milk will be used, while for the grain and oilseeds manufacturing sector we will use the annual value of wheat.
- Fuel Is a second variable intended to illustrate the effect of the cost of fuel (fuel and electricity) on the industrial sectors under analysis. The purpose of including this variable is the effect it could have on the introduction of technologies into the production process.
- Custa Is a dummy variable that illustrates the effects of trade agreements in the Canadian industry $_j$. The trade variable will be represented by a dummy variable which will take the value of 1 for the years CUSTA came into place, 1.5 since Canada joined the NAFTA and the value of 0 otherwise.

- WTO — Is a dummy variable that will take the value of 1 since Canada joined the WTO, and the value of 0 otherwise.
- ε — Is the error term.

The following tables summarize the expected impact of each independent variable as a determinant of inward FDI (Table 4-1).

Table 4-1 Expected signs, Determinants of FDI

Independent Variable	Expected Sign	Independent Variable	Expected Sign
Sector	+	*Tariff*	+
Int Rt.	-	*Subs*	+
FDI (-1)	+	*Custa*	+
WTO	+	*Fuel*	-
Labour	-	*Taxes*	-
Union	-	*Input Cost*	-
Regulations dairy	+	*Regulations grain*	-

4.5.2 Effects of FDI on import and export performance

Literature related to the effects of FDI in trade performance reviewed in chapter 2 mentioned different approaches that suggested the complementary or substitutability effects of FDI on the trade balance. The discussion suggested that the effect depends on the objective followed by foreign investors (either market or resource seeking FDI). However Leichenko and Erickson (1997) also mentioned three perspectives that link FDI with exports. The first argues that increasing levels of inward FDI tend to injure the host country trade performance by increasing imports of intermediate goods. This increase in imports is expected because foreign owned firms tend to import more intermediate inputs than domestic firms (Graham and Krugman, 1995) and if the foreign firm objective is only to serve the domestic market, then no additional exports are expected.

The second viewpoint by Leichenko and Erickson (1997) suggests that FDI will improve the trade position of the host country by increasing international competitiveness, and hence exports of home based firms. This improvement is anticipated as a result of firm level supply activities associated with FDI.

The third perspective suggests that FDI has little overall impact on host country foreign trade (Graham and Krugman, 1995). This viewpoint states that macroeconomic conditions rather than micro-level firm activities dictate the aggregate changes in the trade balance.

The fact is that even though most inward FDI in advanced industrialized nations has the initial objective of penetrating the domestic market (often increasing imports of intermediate goods) (Brouthers et. al. 1995), subsidiary plants can also be used to export production to overseas markets. Then, this observation suggests the possibility of FDI having a substitute effect on exports in the short run but a complementary effect in the long run.

The general specification for the model to test for the effects of FDI on export performance is as follows:

$$Exp_{jt} = \beta_0 + \beta_1 FDI_{t-1} + \beta_2 Exp_{t-1} + \beta_3 Exchange + \beta_4 Custa + \beta_5 WTO + \beta_6 Regulations + \beta_7 Subsidies + \varepsilon$$

Where:

- Exp_{jt} Stands for direct export shipments of industry j in year t.
- $FDI_{j\,t-1}$ Stands for FDI in industry j during year (t-1)
- Exp_{jt-1} Is the level of exports of industry j during year (t-1), intended to capture the cumulative effects of past experiences.
- $Exchge_t$ Is defined as the amount of Canadian currency paid by one unit of U.S. currency.
- $Custa_j$ Is a dummy variable that illustrates the effects of trade agreements in the Canadian industry $_j$. The trade variable will be represented by a dummy variable which will take the value of 1 for the years CUSTA came into place, 1.5 since Canada joined the NAFTA and the value of 0 otherwise.
- WTO Is a dummy variable that will take the value of 1 since Canada joined the WTO, and the value of 0 otherwise.
- $Regulations_j$ Stands for the regulatory environment governing industry $_j$ (supply management or Canadian wheat board), therefore, this variable will only be included in the analysis for the dairy and grain & oilseeds industry. For the dairy manufacturing industry, this variable will include production quota values (expressed in kg butterfat), while for the grain &

oilseeds industry the variable will illustrate the grain elevator tariffs in place while they were regulated by the CGC.

- Subsidies $_{jt}$ Stands for subsidies, reflects the ability of firms to obtain raw materials at a lower cost and the way the influence their ability to compete internationally.
- Trade disp. Stands for trade disputes. This variable is intended to capture the effects of the trade disputes in the dairy sector filed against Canada in the WTO. The dummy variable will take the value of 1 if a dispute was filed against Canada and the value of 0 otherwise.
- ε Is the error term.

The lag structure on FDI is intended to capture the relatively longer time period that may be required for the impacts of the independent variable to have an effect on export performance. The effects are not likely to be felt immediately because modernization of production facilities and dissemination of technologies requires time to take effect (Leichenko and Erickson, 1997). The inclusion of lagged values of exports is intended to capture the accumulation of past experiences affecting current export performance. The exchange rate variable is included in the model in order to account for possible impacts of exchange rate fluctuations and its effect on the trade balance. Regulations are included to incorporate the effects of the regulatory environment that govern the sectors (dairy and grain & oilseeds manufacturing) under analysis. Custa and WTO are intended to reflect the effect of a trade oriented economy on export performance. Table (4-2) summarizes the expected impact of each independent variable on export and import performance.

Table 4-2 Expected signs, effect of FDI on exports

Independent Variable	Expected Sign	Independent Variable	Expected Sign
$FDI_{(t-1)}$	+	$Export_{(t-1)}$	+
Exchange Rate	+	*Custa*	+
WTO	+	*Subsidies*	+
Custa	+	*Regulations dairy*	-
Regulations grain	+		

With respect to the effect of FDI on imports, literature suggests that increasing levels of inward FDI could cause increasing levels of imports (mainly raw or intermediate products) given the high levels of intra-firm trade that takes place through MNEs (Vaughan, 1995; Leichenko and

Erickson, 1997). Extensive research has been done on this topic at different levels of aggregation; however, authors focus their analysis on the following variables: FDI, trade agreements, exchange rates, lagged values of imports, import tariffs among others. The variables elected for this analysis were chosen based on empirical work done by Erickson (1999), Sun (2001) and Zhang and Song (2000), Leichenko and Erickson, (1997) as well as based on the specific characteristics of the Canadian sub-industry and sectors such as the regulatory environment that governs the industries under study (dairy and grain & oilseeds manufacturing).

$$Import_{jt} = \beta_0 + \beta_1 FDI_{t-1} + \beta_2 Import_{(t-1)} + \beta_3 Exchange + \beta_4 Tariff + \beta_5 Custa + \beta_6 WTO + Regulation_{jt} + \varepsilon$$

Where:

- $Imports_{jt}$ Stands for direct import shipments of industry j in year t.
- $FDI_{j\ t-1}$ Stands for FDI in industry j during year (t-1)
- $Import_{j\ t-1}$ Stands for lagged values of imports. Intended to capture the effect of the accumulation of past experiences.
- $Exchge_t$ Is defined as the amount of Canadian currency paid by one unit of U.S. currency.
- $Tariff_{jt}$ Is a proxy that stands for the weighted average of existing import tariffs for industry $_j$.
- Regulations Stands for the regulatory environment governing industry $_j$ (supply management or Canadian wheat board), therefore, this variable will only be included in the analysis for the dairy and grain & oilseeds industry. For the dairy manufacturing industry, this variable will include production quota values (expressed in kg butterfat), while for the grain & oilseeds industry the variable will illustrate the grain elevator tariffs in place while they were regulated by the CGC.
- Custa Is a dummy variable that illustrates the effects of trade agreements in the Canadian industry $_j$. The trade variable will be represented by a dummy variable which will take the value of 1 for the years CUSTA came into

place (1988), 1.5 since Canada joined the NAFTA (1992) and the value of 0 otherwise.

- WTO — Is a dummy variable that will take the value of 1 since Canada joined the WTO (1995), and the value of 0 otherwise.
- ε — Is the error term.

As well as with exports, the lagged structure of FDI is intended to capture the relatively longer time period that may be required for the impacts of the independent variable to have an effect on imports. The lagged value of imports is intended to capture the effects of the cumulative past experiences. The exchange rate variable is included in the model in order to account for possible impacts of exchange rate fluctuations and its effect on the trade balance. Tariffs and regulations are also intended to incorporate the effects of the regulatory environment that governs the industries under evaluation.

Tables (4-3) summarize the expected impact of each independent variable on export and import performance:

Table 4-3 Expected signs, effects of FDI on imports

Independent Variable	Expected Sign	Independent Variable	Expected Sign
$FDI_{(t-1)}$	+	*Import Tariffs*	-
$Import_{(t-1)}$	+	*Custa*	+
Exchange Rate	-	*WTO*	+
Regulations dairy	-	*Regulations grain*	-

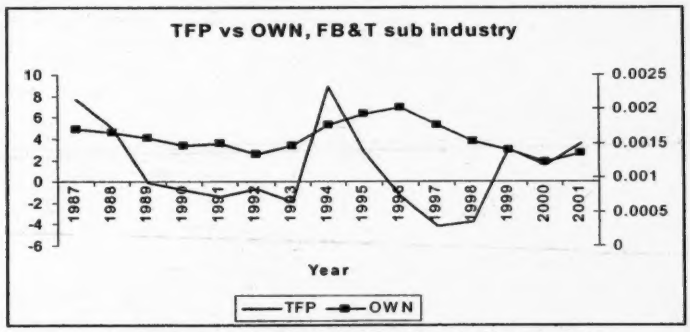
4.5.3 Effects of FDI on TFP growth

Productivity measures the way an economy allocate resources in order to translate them into the production of goods and services. The importance of this "parameter" is the fact that it determines a nation's living standards as well as the level of real income. Harris (1999) made an important distinction between the level of productivity in an economy at a point of time, and the changes in the level of productivity or productivity growth rate:

- Productivity levels are related to the standards of living in a country.
- Productivity growth rates are the major determinant of the rate of increase in living standards over time (Harris, 1999).

There are two major channels through which FDI can improve efficiency of production in the host country: technology transfers and spillover benefits to domestic firms (Gera et. al. 1999). Technology transfer from parent firms can take place through the addition of more capital stock, intra-firm trade and through R&D and innovative activities of MNE's in the host economy.

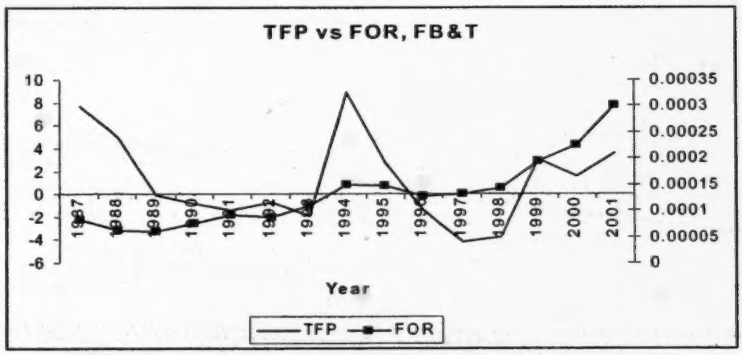
The following illustrations compare the way TFP growth for the FB&T sub industry change as domestic (Figure 4-1) and foreign investment in R&D (Figure 4-2) changes over time.



Source: Statistics Canada, KLEMS database (all factor inputs)

Figure 4-1 TFP growth and domestic R&D investment for the FB&T sub industry

A slow down on productivity growth in the last years of the analysis seems to be associated with decreasing amounts of R&D expenditures.



Source: Statistics Canada, KLEMS database (all factor inputs)

Figure 4-2 TFP growth and foreign R&D investment in the FB&T sub industry

The inflow of new technology and working practices of MNEs can create significant spillover benefits to domestic firms in the host country. This spillover nature can be attributed to the fact that knowledge and technology could spillover from foreign firms to domestic firms through the training of labor and management, which will subsequently benefit domestic firms. In addition,

MNEs can stimulate improvements in quality and reliability of inputs by local suppliers as a consequence of increased competition (Gera et. al. 1999).

Based on the previous facts, the approach to this test rests on the following assumptions:

- Due to the presence of foreign capital and ownership in the Canadian agri-food industry, foreign subsidiaries are likely to be an important outside source of new technology, progressive management and entrepreneurship.
- Canadian subsidiaries owned by a specific foreign country have access to a technology pool represented by the R&D knowledge stock of an specific industry in the country of origin.
- The regulatory environment governing some of the Canadian agri-food industrial sectors influence productivity growth through the restriction and/or promotion of international trade.

Hanel, (2000) described the process of technological spillovers as follows:

An industry output Q_t, in period t is a combination of two separable functions, the technological progress function, A_t and a conventional inputs function, F_t.

$$Q_t = A_t F_t \qquad (1)$$

Technological progress is a function of productive knowledge specified as follows:

$$A_t = \Phi K_t^{\gamma} e^{\lambda t} \qquad (2)$$

Where Φ is a constant, K_t is the stock of productive knowledge in period t, γ is the output elasticity of knowledge capital and λ the trend of technological change. The function of "m" conventional inputs X_m (capital, labor, material inputs, elasticity and services) is written as:

$$F_t = \prod X_{mt}^{\alpha_m} \qquad (3)$$

Where α_m are elasticities of output with respect to the conventional input m. Substituting (2) and (3) into (1) determines output:

$$Q_t = \Phi K_t^{\gamma} e^{\lambda t} \Pi X_{mt}^{\alpha_m} \qquad (4)$$

The stock of productive knowledge is $K_t = \Delta K_t + (1-\delta) K_{t-1}$, where ΔK_t is the investment in productive knowledge in period t, and δ is the depreciation rate of technical knowledge. Expressed in terms in annual growth rates:

$$\Delta Q_t = \lambda + \sum \alpha_m \Delta X_{mt} / X_{mt} + \gamma \Delta K_t / K_t \qquad (5)$$

Assuming constant returns to scale $\sum \alpha_m = 1$, competitive behavior and profit maximizing levels of factors of production other than R&D, the output elasticities can be replaced with the cost shares, s_{mt}. Then the expression: $\Delta Q_t / Q_t - \sum s_{mt} \Delta X_{mt} / X_{mt}$ is equal to the rate of total factor productivity (TFP) growth with respect to conventional inputs X_m. Substituting $\Delta TFP_t / TFP_t$ into (5) we get:

$$\Delta TFP_t / TFP_t = \lambda + \rho \Delta K_t / K_t \qquad (6)$$

A significant portion of the new knowledge cannot be perfectly appropriated by those who create it and can be used by others who have the capacity to learn and use it. The stock of productive knowledge is therefore a function of the domestic industry own R&D and of technological spillovers from industries abroad I_{tij} (Hanel, 2000).

$$K_{tj} = R_{tj} + f_{ij} \sum_i I_{tij} \qquad (7)$$

Where j is the industry using spillovers, i the industry generating them, f_{ij} are empirically determined parameters identifying the effective contribution of international spillovers.

In order to test for the effects of FDI in the Canadian agri-food industry TFP growth, two proxies will be used to evaluate the influence of FDI spillovers, domestic R&D spillovers and foreign subsidiaries operating in Canada spillovers on TFP growth. The lagged values of FDI, industry subsidies, a proxy for the costs of labor (wages/hours worked), costs of inputs, specifically the cost of "fuels" (fuel and electricity) as well as the cost of industrial milk and wheat, unionization rates, a dummy variable intended to illustrate the presence of trade agreements that could affect the performance, and for the analysis of the dairy and grain a& oilseeds sectors, a variable will be added to the analysis in order to capture the effects of the regulatory environment in those sectors (supply management and CWB).

$$TFP_{jt} = \beta_0 + \beta_1 OWN_{j_{t-1}} + \beta_2 FOR_{j_{t-1}} + \beta_3 FDI_{j_{t-1}} + \beta_4 Custa + \beta_5 Union + \beta_6 WTO + \beta_7 \text{Re}gulations + \beta_8 TFP_{jt-1} + \varepsilon$$

Where:

- TFP_{jt} Is the annual rate of growth of total factor productivity for industry j.
- TFP_{jt-1} Is the lagged value of TFP. Intended to capture the effect of past experiences on TFP growth.

- OWN_{jt-1} Is a lagged proxy for domestic R&D spillovers for industry j.

  (OWN= total domestic firms R&D/domestic firms sales in industry j.)

- FOR_{jt-1} Is a lagged proxy for direct foreign spillovers used by industry j and represents the stock of foreign knowledge available to industry j defined as the weighted sum of R&D/Sales executed by industry *j* in each of the main trading countries *k* that Canada deals with (U.S., England, France, Germany, Japan and Italy).

  $$FOR_j = \sum_k (R\&D_{jk})/Q_{jk})c_{jk}$$

  The weights are defined as $c_{jk} = Q_{jkc}/Q_j$, where Q_{jkc} are sales in Canada by subsidiaries belonging to firms from country *k*, and Q_j are total sales of industry *j* in Canada.

- FDI_{jt-1} Is the lagged value of FDI in industry j.

- Regulations Stands for the regulatory environment that governs the industry. Specifically, for the dairy industry production quota values will be used to evaluate its impact on productivity growth, while for the grain and oilseed industry values of elevations tariffs will be incorporated. There are not specific regulations in place for the FB&T industry as a whole. For the dairy manufacturing industry, this variable will include production quota values (expressed in kg butterfat), while for the grain & oilseeds industry the variable will illustrate the grain elevator tariffs in place while they were regulated by the CGC.

- Custa* Is a dummy variable that illustrates the effects of trade agreements in the Canadian industry $_j$. The trade variable will be represented by a dummy variable, which will take the value of 1 for the years CUSTA came into place, 1.5 since Canada joined the NAFTA and the value of 0 otherwise.

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* There are two ways to accommodate the effect of free trade agreements (CUSTA and WTO) in the analysis of the effects of FDI on TFP growth. The first one is by using dummy variables, and the second one by using trade values. The use of trade values will allow us to visualize if MNEs are investing in Canada as a way to exploit location advantages.

- WTO* Is a dummy variable that will take the value of 1 since Canada joined the WTO, and the value of 0 otherwise.
- Union Stands for unionization rate in the Canadian FB&T industry. It is intended to capture the effect of labor unions on productivity growth.
- ε Is the error term.

Table (4-4) summarizes the expected impact of each independent variable on TFP growth for the sub industry and sectors that are the subject of this analysis:

Table 4-4 Expected signs, effects of FDI on TFP growth

Independent Variable	Expected Sign	Independent Variable	Expected Sign
OWN(t-1)	+	*FOR(t-1)*	+
FDI(t-1)	+	*TFP(t-1)*	+
Custa	+	*WTO*	+
Union	+	*Interest rate*	-
Regulations dairy	-	*Regulations grain*	-

4.5.4 The MNE's choice of entry mode into the Canadian Agri-Food industry

Entry modes are defined as the forms of capital participation in international enterprises; they are modes in which MNE's enter the intended host country through investment. In terms of property rights, entry mode is the ownership structure of a foreign subsidiary (Sun, 1999). In the previous chapter we stated that MNEs engage in FDI when they find some advantages from investing abroad. Ownership of specific advantages drives national firms to national and international expansion. A firm which intends to engage in FDI has to make decisions about which form of FDI it should take. Sun (1999) identified transaction costs as a major determinant influencing a MNE choice of entry mode. Firm specific advantages are one important factor that explains the selection process by MNEs on the choice of entry mode. MNE's with higher firm specific advantages prefer to enter a new market with a wholly owned subsidiary rather than joint ventures (Anderson and Gatignon, 1986; Kogut and Singh, 1988), however Makino and Neupert (2000) suggested that joint ventures are preferred over a wholly owned subsidiary when the FDI

* CUSTA trade values are equal to total Canadian trade balance of industry j with U.S.A. and Mexico. WTO trade values are equal to total Canadian trade balance of industry j with the rest of the world.

is resource seeking. The explanation is based on the fact that for a MNE to buy complementary goods in the international market would entail higher costs.

The approach to this study is that firm specific advantages of a parent firm are expected to affect the decision of the choice of entry mode to new foreign markets. Entry mode is a channel that facilitates the transference of firm specific advantages and accesses the local partner contributions to compensate for the lack of specific advantages.

Different entry modes provide a MNE with different levels of control and resource commitment. In the wholly owned mode, a parent firm will have sole control over the subsidiary. In addition, resource transfer would be internal to the firm, reducing the transaction costs of an external market. The joint venture is an intermediate mode of entry, which facilitates access to the local market and to the resources of the host country, while allowing the foreign parent firm to have control over the operation and decision-making process of a local firm.

This empirical study will be focused on the Canadian agri-food manufacturing industries. The study will use cross sectional data from 28 different foreign MNEs operating in the Canadian FB&T manufacturing industry. The analysis will be conducted for the year 2001 and will attempt to evaluate the way firm specific advantages determine the decisions of MNE's to invest in the Canadian agri-food industry through a joint venture or an acquisition.

Our model is detailed as follows:

$$Entry\_\text{mode} = \beta_0 + \beta_1 \log Asset + \beta_2 Effic + \beta_3 Inter + \beta_5 Performance + \beta_6 Location + \beta_8 \text{Re}gulations + \varepsilon$$

The model can be expressed as:

$$E.M. = 1/(1+\exp^{-y})$$

Where E.M. stands for choice of entry mode

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \varepsilon \text{ or } Y = 1/(1+e^{-(a+bx)})$$

Y is the logit transformation. X_i are the independent variables and β_i are the coefficients of the independent variables. β_0 is the constant and ε is the disturbance term.

The variables that will illustrate the MNE's firm specific advantages will be used:

- Log Asset.- Stands for total assets, it will be used as a proxy for the asset power of the firm (large firms usually possess oligopolistic advantages on some of their assets). The log value is used in order to linearize the wide range in assets possessed by MNE's.

- Efficiency.- Stands for firm efficiency. This proxy is intended to illustrate the effects of managerial know how. The proxy will be generated by the ratio of total output/Number of employees in the firm.
- Inter.- Is a proxy used as a measure of international management experience with foreign markets. It is measured by the number of subsidiaries the parent firm has established overseas.
- Performance.- (ability to make profits) is represented by the ratio of net income/total assets.
- Location.- Is a dummy variable intended to illustrate the effect of distance between the MNE's home country and the host country. Specifically it will illustrate if U.S.A. MNEs take some entry mode decisions based on the proximity to Canada versus other countries. It will take the value of 1 if the MNE home country is the U.S.A and the value of 0 otherwise.
- Regulations.- Is a dummy variable intended to capture the effect of regulated sectors in the FB&T industry on the MNEs choice of entry mode. Specifically it will illustrate if industry regulations affect the MNEs involved in the manufacturing of dairy and grain & oilseeds products decisions with regards to the choice of entry mode. Joint ventures are expected given the risk of operating for the first time under an "unknown" regulatory environment.
- The entry mode.- Dependent variable will take the value of 1 if the MNE's choice of entry is acquisition and 0 if the entry mode is by a joint venture.

The following table summarizes the expected impact of each independent variable as a determinant of the MNE's choice of entry mode (Table 4-5):

Table 4-5 Expected signs, MNEs choice of entry mode

Independent Variable	Expected entry mode	Independent Variable	Expected entry mode
Asset	Acquisition	*Inter*	Acquisition
Effic.	Acquisition	*Performance.*	Acquisition
Regul	Joint venture	*Location (U.S. based)*	Acquisition

4.5.5 The Data

As a result of data availability, we will analyze the FB&T industry for the period of 1972-2001, however given the availability of sector disaggregated data and its confidential nature, the empirical analysis for the dairy and grain & oilseed manufacturing industries will only be performed for the period 1987-2001.

The sources for the data used to test for the determinants of FDI are described as follows:

Sector size was collected from CANSIM II, tables 3810011 "Final Demand Categories, by Commodity, M-Level Aggregation" (for dairy and grain manufacturing), while CANSIMII table 3810012 "Final Demand Categories, by Commodity, S-Level Aggregation" provided the data for sector size for the FB&T industry. CANSIM II database were accessed through the University of Alberta library website (www.library.ualberta.ca). Interest rates from Canada and it's main trade partners (G7) were collected from the DSI database, tables 156 60 (Lending Rates Canada), 132 60P (Lending Rates France), 134 60B (Lending Rates Germany), 136 60P (Lending Rates Italy), 158 60F (Lending Rates Japan), 112 60P (Lending Rates U.K.), and 111 60P (Lending Rate U.S.A). According to the DSI database, the tables contained in it are originated from the IMF. As with CANSIM II, DSI database was accessed through the University of Alberta library website (www.library.ualberta.ca).

FDI values for the FB&T industry were obtained from the Statistics Canada publication "Canada's International Investment Position" catalogue 67-202-XPB as well as from CANSIM II table 3760038 "International Investment Position, Canadian Direct Investment Abroad and Foreign Direct Investment in Canada", while FDI values for the dairy and grain & oilseeds manufacturing sectors were kindly provided by Statistics Canada. Import tariffs were collected from "The International Customs Journal No. 57" editions 16^{th} – 22^{nd}. Information on subsidies related to the FB&T industry (MII) were collected from the Agriculture and Agri-Food Canada website (http://www.agr.gc.ca), while subsidies and quota regulations related to the dairy industry were collected from the Canadian Dairy Commission annual reports (various volumes). WGTA subsidies and elevator tariffs were collected from the Canadian Grain Commission Annual Report and the Canadian Grain Commission Bulletins (various volumes). The data related to GDP, FDI and subsidies were deflated using 1992 Canadian CPI values.

Data for the analysis of the effects of FDI on export and import performance for the FB&T industry were obtained from the FAO annual trade book collection*, imports and exports for the dairy and grain industrial sectors come from the same source. Exchange rates were also obtained from the FAO annual trade book collection. FDI values for the dairy and grain & oilseed manufacturing industries were kindly provided by Statistics Canada. Import tariffs and interest rates were collected from previously mentioned sources. Unionization rates were obtained from the Statistics Canada publication "Manufacturing Industries of Canada: National and Provincial Areas" Catalogue 31-203-XPB table 4.

The data for the analysis of the effects of FDI on TFP growth came from a variety of sources:

TFP values come from the KLEMS database provided by Statistics Canada, which provides index data about capital, labor, energy, materials, and services inputs, as well as indexes related to value-added, gross output, and combined inputs. Data contained in KLEMS database is expressed in Fisher ideal index. As mentioned in chapter 2, Fisher ideal index uses an average weight of the Paasche and Laspeyres indexes in order to include the base and the comparison period minimizing problems of a biased estimation that could arise when using either of the previously mentioned indexes. Using the KLEMS database, TFP is estimated by dividing the quantity index of gross output over the quantity index of combined inputs. The values used in this analysis correspond to the difference in annual TFP growth for every industry/sector under analysis. Industrial TFP indexes are also readily available at the Industry Canada website (www.strategis.gc.ca). The difference between these two TFP estimations is based on the fact that the one available from the KLEMS database is estimated using the "quantity index of combined inputs", while the one available in the strategies website was estimated using "number of workers employed", both estimations follow a similar pattern through the years.

Data related to the cost of fuel and electricity as well as wages and hours of labor per industry/sector were obtained from the Statistics Canada publication "Manufacturing Industries of Canada: National and Provincial Areas" Catalogue 31-203-XPB table 4. The values of all the previous variables with the exception of TFP and persons employed by industry were deflated using 1992 Canadian Consumer Price Index (CPI) values obtained from the CANSIM II table 3260001 "Consumer Price Index".

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* Table number can vary from every yearly volume of the FAO annual trade book collection

For the analysis at the FB&T industry level, data of sales by foreign subsidiaries were obtained from the Statistics Canada publication "CALURA" catalogue 61-220-XPB annex table 1 "Major Financial Characteristics, by Industry and Control" (including food retailing), this data was kindly complemented by Statistics Canada who provided the data from 1980 to 2000 with out food retail values. Data for R&D expenditures were obtained in the OECD ANBERD database, while the OECD STAN database provided information related to industry sales. Unionization rates were obtained from the Statistics Canada Publication "Annual Report of the Minister of Regional Industrial Expansion under the Corporations and Labor Unions Returns Act. Part II, Labor Unions" which contains historical data since 1963. Meanwhile, given the confidentiality nature of some data related to the dairy and grain & oilseeds manufacturing industries, this data was kindly provided by Statistics Canada. Information related to production quotas and grain elevator tariffs were obtained from previously mentioned sources.

The analysis to test for the MNE's choice of entry mode into the Canadian agri-food industry will be done using cross sectional data from 28 different foreign MNE's operating in Canada in the FB&T industry during the year 2001. Data for the analysis comes from different sources, mainly from the Mergent online database which provides annual reports and financial data for publicly traded companies around the world. The publications "Major Companies of Europe" by Graham Whiteside as well as "Nelson's Directory of Investment and Research" contain limited financial information, however they provide some description of the latest events in which the companies have been involved (M&A). In some cases, the MNE's websites were use to complement some missing information from the previous sources (i.e. number of employees which is seldom found in the annual reports). The Annual Directory of Mergers & Acquisitions in Canada provides detailed information about M&A activities in Canada (1991-2001) in the FB&T industry. This publication was the source of the names of the MNEs included in the sample of this analysis.

4.6 Findings, unit root and causal relations

Appendix (A) illustrates the results obtained from the Augmented Dickey Fuller (ADF) unit root test for the variables included in the analysis of the food, beverage and tobacco sub industry (FB&T). As mentioned during the discussion about the unit root test, testing for unit roots indicates nonstationarity (if data possess a time trend). The importance of testing for unit roots is that nonstationary data may lead to cointegrating relationships (biased results). Results from the ADF unit root test fail to reject the hypothesis of a unit root for the independent variables at the

.05 and .10 level. Therefore we conclude that the variables used for the analysis for the FB&T sub industry are I(0) or stationary. The next step is to proceed to test for cointegration relationships for our analysis. Appendixes (B to E) contain the results obtained for the cointegration analysis performed on the variables included for the analysis of the determinants of FDI, the effects of FDI on exports and imports, and the effects of FDI on TFP growth for the FB&T sub industry. Findings from the cointegration analysis were of a significant unidirectional Granger causality relationship between sector size and FDI (Appendix B). No further significant evidence of Granger causal relations were found among the explanatory variables and the dependent variables under analysis for the food, beverages and tobacco sub industry.

Appendix (F) illustrates the results obtained from the Augmented Dickey Fuller unit root test for the analysis in the dairy products manufacturing sector. Results from the ADF unit root test fail to reject the hypothesis of a unit root for the independent variables at the .05 and .10 level. Therefore we conclude that the variables used for the analysis for the dairy products manufacturing sector are I(0) or stationary. Appendixes (G to J) contain the results obtained from the cointegration analysis performed on the variables included for the dairy product manufacturing industry. The cointegration analysis in the dairy product manufacturing sector found evidence of unidirectional granger causality of past FDI values. Therefore lagged FDI values is said to granger cause present values of FDI. Significant evidence for FDI was found to granger cause import for the dairy manufacturing sector. No evidence of further causality relations was found among other variables included in the analysis for the dairy manufacturing sector.

Appendix (K) illustrates the results obtained from the Augmented Dickey Fuller unit root test for the grain and oilseeds products manufacturing sector. Results from the ADF unit root test fail to reject the hypothesis of a unit root for the independent variables at the .05 and .10 level. Therefore we conclude that the variables used for the analysis for the grain and oilseeds products manufacturing sector are I(0) or stationary.

Appendixes (L to O) contain the results obtained from the cointegration analysis performed on the variables included for the grain and oilseeds product manufacturing industry. The cointegration analysis for the grain and oilseeds product manufacturing sector also found evidence of unidirectional Granger causality among for unionization rates to Granger cause FDI for this industrial sector. The causality analysis for the effects of FDI on grain and oilseeds

manufacturing products exports found significant evidence for past values of exports to Granger cause present values of exports. Significant evidence of import tariffs was also found to affect import volumes of grain and oilseeds manufactured products. No evidence of further causality relations among variables included in the analysis for the grain and oilseeds manufacturing sector was found.

4.7 Regression results

Tables (4-6 to 4-9) include the regression results for the analysis of the determinants of FDI for the food, beverage and tobacco (FB&T) sub industry, as well as for the dairy, and grain and oilseeds manufacturing sectors. The omitted variables from the "general model" mentioned in previous sections, were ruled out by running model specification tests (Ramsey reset test), as well as by the degree of correlation among them, which affected the significance of the independent variables. Autocorrelation problems are common when using time series models. In this analysis autocorrelation is tested with Durbin Watson *h* statistic. Durbin Watson's *d* statistic cannot be used to test for correlation in auto regressive models because the computed d value generally tends to 2, which is the value of d expected for a truly random sequence (Gujarati, 1995). Durbin Watson's *h* statistic is the alternative test to test for correlation in autoregressive models. For these analyses, the null hypothesis of no positive first order autocorrelation can not be rejected given that the Durbin "h" critical value lies between the acceptance zone ($-1.96 \leq h \leq 1.96$), therefore we conclude that there is not evidence of first order auto correlation.

Limited sector data availability limited our comparative analysis for the period 1987-2001. Data was available for a longer time period for the aggregated industry (FB&T) but not for the dairy, and grain and oilseeds manufacturing sectors (1987-2001). The Chow test allowed us to test for structural change. For the analysis of the determinants of FDI for the FB&T sub industry (1972-2001), the test rejected the null hypothesis which states that the coefficients are the same in both time periods. By rejecting the null hypothesis, we confirm the fact that structural changes are present from 1972-2001. We point at trade agreements (CUSTA and WTO) as the main cause for structural changes in this period. Our analysis rejected the null hypothesis given that the computed F-stats (7.05) > F-critical (5.99).

F stats= {[3.91-(1.63+1.30)/7] / [(1.63+1.30)/29-7(2)]} is equal to 7.05, from F critical table at 5%, F critical = 5.99

The Chow test for the analysis of the effects of FDI on exports for the FB&T sub industry (1972-2001) also rejected the null hypothesis; therefore, we confirm the fact that structural change is present for the period 1972-2001 for this analysis. [Computed F stats 7.4> F critical 5.09].

F stats={[4.95-(1.73+1.43)/6] / [(1.73+1.43)/29-6(2)]} is equal to 7.4, from F critical table at 5% F critical=5.09

The Chow test for the analysis of the effects of FDI on imports for the FB&T sub industry (1972-2001) rejected the null hypothesis which states that the coefficients are the same in both time periods. By rejecting the null hypothesis, we confirm the fact that structural changes are present for the period 1972-2001. [Computed F stats 5.81> F critical 5.33].

F stats={[6.83-(2.42+2.11)/5] /[(2.42+2.11) / 29-5(2)]} is equal to 5.81, from F critical table at 5% F critical=5.33

The Chow test for the analysis of the effects of FDI on TFP growth for the FB&T sub industry (1972-2001) rejected the null hypothesis which states that the coefficients are the same in both time periods. By rejecting the null hypothesis, we confirm the fact that structural changes are present for the period 1972-2001. [Computed F stats 5.81> F critical 5.33].

F stats=[{6.40-(1.92+1.75)/6] /[1.92+1.75)/6(2)] is equal to5 .64, from F critical table at 5% F critical=5.09

The presence of structural change in the model allows us to report our findings for both the analysis for the period 1972-2001, and the period of 1987-2001.

Through the analysis for the determinants of FDI inflows into the Canadian agri-food industry we made an attempt to model most of the variables that have been used in previous literature. Our findings (table 4-6) for the analysis of the FB&T industry (1972-2001) were of a positive and significant evidence of past values of FDI and import tariffs to be important FDI attractors into the Canadian food, beverages and tobacco industry. Our results suggests that MNE's do not base their decisions to invest based on static events that take place in an specific economy or industry, rather they make decisions based on the accumulations of past experiences. Subsidies for the FB&T sub industry also provide additional incentives for MNEs to foreign direct invest; specifically MNEs could be attracted by the low cost of R&D in the country and the contributions of it to their performance. As expected, the Canadian trade policy orientation is also an attractive FDI incentive to MNEs. Increasing MNE's control of the Canadian FB&T industry could be

explained as an attempt to control the supply of the domestic market. This fact could be the reason of the consolidation pattern that is taking place in the FB&T industry in Canada, but also to supply foreign markets, specifically the U.S. market given the existing free trade agreements between these two countries.

Table 4-6 Determinants of FDI in the FB&T sub industry (1972-2001)

Independent variable (FB&T)	Regression Coefficient	Standard error	t-statistic	p-value	Adjusted R^2
C	2820.12	4333.93	.6507	.515	.6356
FDI(-1)	.2448	.1217	12.2201	.000*	D.W. "d" statistic 2.4663
Sector	-.2975 (-.06885)	.1917	-1.5514	.121	D.W. "h" statistic 1.8141
Tariff	.722676E-5 (-.0024)	.186307E-2	.3878E-2	.997	F-test 14.347
Subsidies	68.9275 (.0159)	33.6519	2.0482	.041*	
Custa	834.68	386.86	2.1575	.031*	
WTO	-891.52	658.664	-1.3535	.176	
Union	7.5186 (.0333)	32.8491	.2288	819	
RHO	-1.5558	.1666	-9.3355	.000*	

*Significant at the .05 level, **Significant at the .10 level.

Literature related to the theory of the firm and the MNE's, suggest that in addition to the protection of proprietary knowledge (the firm's competitive advantages), MNE's seems to look after the exploitation of additional "local advantages" which could be identified by the presence of subsidies and free trade agreements.

Table 4-7 Results: Determinants of FDI, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-13862.7	10456.1	-1.3258	.185	.8590
FDI(-1)	.9493	.1727	5.4973	.000*	D. W. "d" statistic -.5519
Sector	.2118 (.3997)	.4297	.4929	.622	D. W. "h" statistic 1.3487
Tariff	.02167 (.8478)	.6072E-2	3.5694	.000*	F- test 12.358
Subsidies	-44.4595 (-.0175)	47.6209	-.9336	.351	
Custa	219.27	621.364	.3528	.724	
WTO	1255.86	700.154	1.7937	.073**	
Union	11.0868 (.0397)	42.6755	.2597	.795	
RHO	-1.1656	.25255	-4.6153	.000*	

*Significant at the .05 level, **Significant at the .10 level.

Our findings are, in general, consistent with literature; however our findings did not find evidence of labor as a determinant of FDI in the Canadian manufacturing industry. The reason to compare our findings particularly with Sounders (1982) is to illustrate that it can not be assumed that the same factors that affect an aggregate industry (the Canadian manufacturing industry studied by Sounders (1982) necessarily affect the same way the sectors contained in it.

Table (4-7) contains the results for the analysis of the determinants of FDI into the Canadian FB&T sub industry for the period 1987-2001. The analysis for the determinants of FDI was done using ordinary least squares. Our findings for this analysis are consistent with the findings for the period 1972-2001, where evidence of positive and significant coefficients were found for past values of FDI, and free trade agreements (WTO) as the main FDI attractors. The long run elasticity for import tariffs tends to be unit elastic (appendix P), which suggest that MNEs increasingly value the protection of additional foreign competition provided by import tariffs in the FB&T sub industry.

Table 4-8 Results: Determinants of FDI, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	2144.32	1640.11	1.3074	.191	.7496
FDI(-1)	.3591	.02198	163.394	.029*	**D.W. "d" statistic** 2.5589
Sector	1.1905 (.1017)	.1692	7.0365	.000*	**D.W. "h" statistic** .9763
Tariff	1.2385 (.8149)	4.2809	.2893	.772	**F- test** 3.295
Subsidies	-3.1162 (-.122983)	1.0158	-.30678	.112	
Custa	486.765	168.809	2.8835	.004*	
WTO	-1030.90	1272.92	-.8098	.418	
Regulations	-.0102 (-.87885)	.0069	-1.4673	.142	
Union	-66.3105 (-.38422)	13.2561	-5.0022	.000*	
Taxes	104.335 (.2008)	48.1805	1.1650	.130	
Fuel	3.3718 (.11453)	1.6672	1.0223	.243	
Input costs	-78.0304 (-.1125)	27.1121	-2.8780	.004*	
RHO	.9463	.0558	16.9441	.006*	

*Significant at the .05 level, **Significant at the .10 level.

Results for the analysis of the determinants of FDI for the dairy products manufacturing sector are contained in table (4-8). Findings suggest that past values of FDI, sector size and free trade agreements (Custa and Nafta) positively influence the decision to foreign invest in the Canadian dairy manufacturing sector. Meanwhile input costs and unionization rates were found to have a significant negative effect as FDI attractors. In the long run, sector size will still have a significant positive effect as an FDI determinant. However, both the short run (measures immediate response) and long run elasticities for the unionization rate variable, as well as the input cost variable reflect an inelastic behavior (appendix Q).

When comparing the results versus the sub industry analysis, we find consistency in the fact that the size of the Canadian dairy manufacturing industry and the geographical extension of the Custa/Nafta free trade agreement were seen by foreign firms such as Unilever and Yougen Fruz as an opportunity to invest mainly in the ice cream and yogurt business until the mid nineties when Parmalat made a significant investment in the dairy sector by acquiring Beatrice foods.

Table 4-9 Results: Determinants of FDI, grain manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	1717.88	3964.96	.4332	.665	.7694
FDI(-1)	.3399	.1662	2.0450	.133	**D.W. "d" statistic** 2.2009
Sector	.0808 (.3465)	.1810	.4467	.655	**D.W. "h" statistic** .4503
Tariff	111.675 (.5284)	47.9603	2.3284	.020*	**F- test** 4.730
Custa	560.106	215.323	2.6012	.009*	
WTO	400.537	382.512	1.0471	.295	
Regulations	81.0050 (.37432)	118.993	.6807	.496	
Union	-18.9752 (-.0919)	15.8300	-1.1986	.231	
Taxes	-162.530 (-.02473)	189.085	-.8595	.390	
Fuel	18.9004 (.25760)	29.1476	.6484	.517	
Input costs	-7.8972 (-.19783)	4.3932	-1.7975	.072**	
RHO	-.2801	.3759	-2.0451	.056*	

*Significant at the .05 level, **Significant at the .10 level.

Results for the analysis of the determinants of FDI on the grain and oilseeds products manufacturing sector are contained in table (4-9). Findings suggest that free trade agreements (Custa/Nafta) have played an important role as an FDI attractor into the grain sector. MNE's have been active in the Canadian grain sector for over 20 years, however during 1991 the acquisition

by Archer Daniels Midland (ADM) of the biggest canola crushing plant to United Grain Growers (UGG) started a period of mergers and acquisitions that derived in a present highly concentrated sector with a foreign share of over 50%. The analysis also found a positive and significant effect of import tariffs as a determinant of inflows of FDI. As expected, higher input costs (cost of wheat) were found to negatively affect the decision to invest in the sector. The short and long run elasticities for tariffs and input costs still reflect an inelastic impact of these variables on FDI inflows (appendix R).

Table (4-10), provides a comparison of our findings for the analysis of the determinants of FDI versus similar empirical works. Our findings are consistent to previous analysis; overall, sector size, openness to trade and input and labor costs are the variables that were more often found to have a significant impact as an FDI determinant. Results illustrates that both sectors and the FB&T sub industry react differently to the same variables except to trade. Canada's incorporation to trade agreements such as Custa, Nafta and the WTO is having a positive impact on attracting foreign capitals to the FB&T sub industry as well as for both sectors. As we discussed before, this fact could be seen as a locational advantage by MNE's given that based on trade agreements could have less restricted access to the entire North American market (Canada, U.S.A. and Mexico). This result is consistent with findings from Changhui (2002), Zhang (2001), Yih (2000) and Walkenhorst (2000) whose findings were also of a positive and significant impact of trade openness as an FDI attractor.

Table 4-10 Comparison of studies on determinants of FDI

	FB&T	Dairy	Grain	Zhou, Changhui et. al. 2002	Zhang, Kevin. 2001	Yih, J. et.al. 2000	Gopinath, M. et. al., 1999	Walkenhorst P. 2000	Billington,N. 1999
FDI(-1)	x	x		x					
Sector		.101			x			x	x
Tariff	.847		.528						
Subsidies					x				
Union/Labor		-.384				x	x		x
Taxes				x	x				x
Input cost		-.112	-.197				x	x	
Trade (dummy)	x	x	x	x	x	x		x	

*Values under FB&T, dairy and grain are elasticities of variables that were found to be significant at the .5 or .10 level.

There is evidence for the FB&T sub industry that high import tariffs also promote FDI inflows. Higher input costs as expected are negatively affecting FDI inflows for both sectors but not for the FB&T sub industry, this result is consistent with Walkenhorst (2000) and Gopinath (1999).

The regression analyses for the effects of FDI on exports were done using LIML, the analyses were corrected for first order autocorrelation using AR1. After correcting for first order autocorrelation, we cannot reject the null hypothesis of no positive autocorrelation for this model. The Durbin "h" values lies between the "acceptance" zone and therefore we conclude that there is no evidence of first order autocorrelation for the export model.

Our analysis for the FB&T industry (1972-2001) found positive and significant evidence of past values of FDI as well as subsidies to increase exports from the Canadian food, beverages and tobacco industry (table 4-11). Our findings suggest that FDI and exports behave as complements and that they are not mutually excluding. This complementary effect also confirms that MNE's are not only investing in Canada to supply the domestic market, but also they are investing in Canada to supply foreign markets, specifically the geographical location of Canada with respect to U.S. (the largest world economy). This also suggests that by investing in Canada, MNE's have within arms reach the possibility of supplying two important markets.

The Matching Investment Initiative (MII) is a research subsidy program that is specific for the Canadian agri-food industry, as discussed in chapter 3, the general approach of the MII is that the cost for R&D for firms investing in this industry would be 50% of the total cost given that the federal government would match the investment dollar per dollar. The positive and significant coefficient found for subsidies to influence exports suggest that the MII has been successful in increasing production through the creation of an incentive to incorporate technology deriving in efficient production processes and improved managerial skills that are making this sub-industry become more competitive in the international arena.

Table 4-11 Results: Effect of FDI on exports, FB&T sub industry (1972-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	15278.1	4981.27	3.0671	.002*	.7578
Exports(-1)	.02390	.1936	.1234	.902	**D.W. "d" statistic** 1.7151
FDI(-1)	.1391 (.1317)	.0683	2.0375	.042*	**D.W. "h" statistic** .1603
Exchange	-4787.29 (-.5972)	3575.41	-1.3389	.181	**F- test** 11.027
Subsidies	158.642 (.0367)	49.7241	3.1904	.001*	
Custa	183.937	800.512	.2297	.818	
WTO	195.310	856.573	.2280	.820	
RHO	.7718	.1582	4.8769	.000*	

*Significant at the .05 level.

Table (4-12) contains the results for the analysis of the FB&T sub industry exports (1987-2001). As with the previous analysis, the results are still consistent when using a longer period of time. The only difference is that in addition to the findings of positive and significant evidence of FDI and subsidies, we also found positive and significant evidence of WTO to increase exports. The significance of the new coefficient does not alter our results given that it is expected from trade agreements to have an impact in the trade balance. Therefore, we still have consistent results with regards to the complementary effect of FDI and exports for the FB&T industry.

Table 4-12 Results: Effect of FDI on exports, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	10283.4	3344.37	3.0748	.002*	.9354
Exports(-1)	.0918	.2567	.3577	.721	**D.W. "d" statistic** 2.5215
FDI(-1)	.1970 (.2028)	.0452	4.3526	.000*	**D.W. "h" statistic** .9501
Exchange	-2707.92 (-.3108)	2065.31	-1.3111	.190	**F- test** 3.923
Subsidies	73.2253 (.03198)	45.4956	1.6095	.108**	
Custa	59.0730	449.015	.1315	.895	
WTO	2318.43	432.888	5.3557	.000*	
RHO	-.6795	.2503	-2.7143	.007*	

*Significant at the .05 level. **Significant at the .10 level.

The long run elasticity for FDI values (appendix S), suggests that FDI will still have an increasing significant effect on export volumes for the agri-food industry, however export growth even though complementary to FDI won't grow at the same pace (inelastic behaviour).

Table 4-13 Results: Effects of FDI on Exports, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	132.524	548.460	.2416	.809	.8287
Exports(-1)	.3713	.3559	1.0431	.297	**D.W. "d" statistic** 1.3905d
FDI(-1)	-.0165 (-.0408)	.0476	-.3469	.729	**D.W. "h" statistic** .9763
Exchange	47.6992 (.2507)	192.758	.2474	.805	**F- test** 6.104
Subsidies	-.9634 (-.7628)	.3055	-2.1535	.202	
Custa	23.6169	67.85	.3480	.728	
WTO	84.1475	24.330	3.4581	.001*	
Regulations	.9523E-03 (.8981)	.2604E-02	.3656	.715	
Trade disputes	-29.2341	11.0135	-2.6544	.008*	
RHO	.5807	.1650	3.5192	.000*	

*Significant at the .05 level

The analysis for the effect of FDI on dairy manufactured products exports found positive and significant evidence of WTO to increase exports (table 4-13). The result is consistent with changes in the Canadian dairy policy, which allowed producers to increase fluid milk production over the quota regulations for export purposes only. This new regulation was seen by Canadian trade partners as a dumping practice given that the price of milk for export purposes was lower that the price for domestic consumption. Since 1995, Canada has been taken to the WTO dispute settlement panel in several occasions as a result of their dairy export policy, and even though the WTO has ruled against Canada, Canada has managed to modify their export policy to keep exporting while waiting for a new WTO resolution. The negative and significant coefficient for the trade dispute variable captures the effect of WTO negative resolutions on the Canadian dairy export policies.

Grain manufactured products exports were found to be significantly affected by FDI inflows, exchange rates, and free trade agreements (Custa, Nafta, and WTO). Results suggest a complementary effect between FDI and exports of grain products, but also suggest that MNEs are taking advantage of the Canadian trade oriented policy to supply the domestic and foreign markets (table 4-14). Even though the CWB does regulate exports of some grains (Wheat and Barley), it does not regulate exports of manufactured products, however the result of this analysis and the long run elasticity for FDI (appendix U) could be an indication of the future expectations by MNEs with regards to the export regulatory environment governing the grain sector.

Table 4-14 Results: Effects of FDI on Exports, grain manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	21146.8	5757.30	3.6730	.000*	.7319
Exports(-1)	.1815	.2914	.6230	.533	**D.W. "d" statistic** 2.086
FDI(-1)	4.4565 (.3535)	.7233	2.5860	.010*	**D.W. "h" statistic** .0602
Exchange	7701.39 (.15319)	1990.58	2.8689	.008*	**F- test** 7.092
Subsidies	.7659 (.0803)	.6697	1.1435	.253	
Custa	2588.74	1508.96	1.7155	.086**	
WTO	1149.27	287.721	3.9943	.000*	
Regulations	-627.434 (-.19284)	339.360	-.8488	.492	
RHO	.96031E-2	.12168	1.2789	.037*	

*Significant at the .05 level. **Significant at the .10 level.

Table (4-15) provides a comparison of our findings with available literature. The complementary or substitute effect of FDI on exports has been widely studied and our findings of a complementary effect between FDI and exports for the FB&T sub industry and the grain and oilseeds manufacturing sector are consistent with general literature.

Table 4-15 Comparison of studies on the effects of FDI on exports

	FB&T	Dairy	Grain	Leichenko, R. et. al.. 1997	Sun, H. 2001	Zhang, K. et.al. 2000	Pain, N. et.al. 1998	Bertschek,,I. 1995	Fontagne, L. 1999
Exports(-1)				x	x	x			
FDI(-1)	.2028		.3535	.152	x	x	.062	x	x
Exchange			.1531	.00048	x	x		x	
Subsidies	.0319								
Trade	x	x	x					x	
T. disputes		x							
Regulations									

*Values under FB&T, dairy and grain are elasticities of variables that were found to be significant at the .5 or .10 level.

Results for the analysis of the effects of FDI on industry imports for the FB&T industry (1972-2001) are contained in table (4-16). This analysis was done using LIML. Based on the obtained Durbin "h" coefficient, we cannot reject the null hypothesis of no positive autocorrelation for this model. The Durbin "h" value of .1275 lies between the "acceptance" zone and therefore we conclude that there is no evidence of first order autocorrelation for the import model.

The analysis also found evidence of a negative and significant coefficient for import tariffs, this results suggests that import tariffs in the Canadian FB&T sub industry do provide an effective protection against imports. Even though not significant as an FDI determinant, import tariff protection might be influencing to a certain extent the decisions made by MNEs to invest in the country. The analysis for the effect of FDI on the food, beverages and tobacco industry imports found positive and significant evidence of past values of imports, FDI and free trade agreements (WTO, Custa and, NAFTA) to increase imports in this sub industry.

As with the analysis of the determinants of FDI, the significant coefficient found for past values of imports suggests that MNE's take decisions based on the accumulations of past experiences. However the positive and significant coefficients for FDI and free trade agreements (WTO, Custa, and Nafta) suggest that there is also a complementary effect of imports and FDI. This effect could be explained by the increase of intrafirm trade that takes place among MNE's and

that has been widely documented in literature by Hanel (2000), Hejazi and Safarian (2001), Fontagne (2001), Brouthers (1995), Pain and Wakelin (1998) among others.

Table 4-16 Results: Effect of FDI on imports, FB&T sub industry (1972-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	3093.77	1306.00	2.3688	.018*	.9384
Imports(-1)	.4637	.1273	3.6402	.000*	**D.W. "d" statistic** 1.9643
FDI(-1)	.0959 (.90813E-5)	.0416	2.3061	.021*	**D.W. "h" statistic** .1275
Exchange	541.47 (.0675)	1239.19	.4369	.662	**F- test** 5.071
Tariffs	-.2399E-2 (-.8032)	.1248E-2	-1.9224	.055**	
Custa	535.538	270.073	1.9829	.047*	
WTO	1631.76	485.19	3.3631	.001*	

*Significant at the .05 level. **Significant at the .10 level.

The significant coefficient for trade agreements suggests that intrafirm trade is being facilitated by the "open border" or trade oriented policy that has been undertaken by Canada since the late eighties. Important mention must be given to the fact that even though in the analysis for the determinants of FDI the trade agreements variable were not found significant, the significant results for FDI and trade agreements in the analysis for imports suggest that MNEs does look after trade oriented countries to foreign direct invest. This effect could be captured in the significant coefficient of past values of FDI as a determinant for inward FDI in the Canadian FB&T sub industry.

Table 4-17 Results: Effect of FDI on imports, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	962.363	1030.45	.9339	.350	.9391
Imports(-1)	.3418	.1095	3.1192	.002*	**D.W. "d" statistic** 2.6411
FDI(-1)	.03615 (.0473)	.01812	1.9945	.046*	**D.W. "h" statistic** 1.1398
Exchange	1579.36 (.2042)	1192.75	1.3241	.185	**F- test** 5.206
Tariffs	-.1755E-3 (-.0938)	.7402-3	-.2371	.813	
Custa	1678.53	218.555	7.6801	.000*	
WTO	1537.52	236.53	2.9502	.008*	
RHO	-.5566	.1457	-3.8188	.000*	

*Significant at the .05 level. **Significant at the .10 level.

Table (4-17) contains the results for the analysis of the effect of FDI on imports for the FB&T sub industry for the period 1987-2001. The model was corrected for first order autocorrelation using AR1. The results were found to be consistent with the previous analysis. Evidence of positive and significant relations between past values of imports, FDI and free trade agreements (WTO, Nafta and Custa) were found to positively influence the increase of imports of FB&T products. In the long run, MNEs are expected to increase imports (mainly attributed to intrafirm trade) which could explain the inelastic effect of FDI on FB&T imports (appendix V).

Table 4-18 Results: Effects of FDI on imports, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	15.5123	148.969	.10413	.917	.7236
Imports(-1)	.7555	.2585	2.9224	.003*	**D.W. "d" statistic** 2.4290
FDI(-1)	-.0101 (-.0659)	.0144	-.7014	.483	**D.W. "h" Statistic** .7744
Exchange	49.7615 (.3457)	66.0054	.7539	.451	**F- test** 4.353
Tariffs	-.4920 (-.3875)	.2916	-1.6871	.092**	
Custa	20.5295	34.04	.6033	.546	
WTO	170.632	80.6631	2.1153	.034*	
Regulations	-.3706E-03 (-.20165)	.08396E-03	-.4414	.659	
RHO	-6013	.2221	-2.7059	.007*	

*Significant at the .05 level. **Significant at the .10 level.

Results for the analysis of the effects of FDI on the dairy sector imports (table 4-18) are consistent to the ones found in the analysis for the FB&T sub industry. Past values of imports as well as WTO were found to positively influence increasing imports while import tariffs were found to negatively influence dairy product imports. FDI was not found to significantly impact dairy products imports. The long run elasticity of import tariffs (appendix W) suggests that the dairy sector will continue to be effectively protected from foreign competition (via dairy product imports). The protection of the domestic market by import tariffs could promote further consolidation of the Canadian dairy manufacturing sector.

The analysis for the effects of FDI on grain products manufacturing imports generated consistent results as with the analysis for the dairy and food, beverages and tobacco sub industry (table 4-19). Past values of imports (the accumulation of past experiences) positively affect increasing sector imports, meanwhile the Canadian access to the WTO significantly affected the inflows of imports of grain processed products; however the trade balance for this sector is overwhelmingly

favorable for grain products exports. As with dairy, no significant effect was found from FDI towards grain and oilseeds import flows.

Table 4-19 Results: Effects of FDI on imports, grain manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	7882.52	11816.3	.6670	505	.8941
Imports(-1)	.5391	.0467	2.5680	.010*	**D.W. "d" statistic** 1.7872
FDI(-1)	7.1008 (.2355)	.2140	1.3436	.179	**D.W. "h" statistic** .6071
Exchange	5193.18 (.3155)	8907.03	.5830	.560	**F- test** 9.117
Tariffs	-124.45 (-.0384)	452.712	-.2749	.783	
Custa	-761.145	4257.61	-.1787	.858	
WTO	8466.04	1196.59	7.0751	.000*	
RHO	-.4258	.2135	-1.9940	.046*	

*Significant at the .05 level. **Significant at the .10 level.

Table (4-20) provides a comparison of the effects of FDI on imports with available literature. Our finding of a complementary effect of FDI and imports for the FB&T is consistent with other empirical work that has been done also at an aggregate industry level. However at the sector level we did not find evidence of FDI influencing imports, imports were influenced mainly by the existence of free trade agreements. This result illustrates that the same variables have a different outcome when performing the analysis at a further disaggregated level than the manufacturing industry as a whole.

Table 4-20 Comparison with other studies; effects of FDI on imports

	FB&T	Dairy	Grain	Wilamoski, P. et.al. 1999	Alguacil, M. et.al. 2002	Fontagne, L. 1999	Hejazi, W. et.al. 1999	Brouthers, L. et.al. 1995
Imports(-1)	x	x	x					
FDI(-1)	.0473			.077	x	x	x	x
Exchange				.353			x	
Tariffs		-.3875						
Trade	x	x	x				x	

The analysis for the effects of FDI on TFP growth for the FB&T industry (1972-2001) was done using LIML. The Durbin "h" value of .5048 lies between the "acceptance" zone and therefore we conclude that there is no evidence of first order autocorrelation for the productivity model (table 4-21).

Table 4-21 Results: Effects of FDI on TFP growth, FB&T sub industry (1972-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	12.6144	20.2042	.6243	.532	.3217
Own(-1)	18295.5 (.0028)	5879.12	3.1119	.002*	D.W. "d" statistic 2.1274
For(-1)	25075.9 (.2023E-3)	63829.2	.3928	.694	D.W. "h" statistic .5048
FDI(-1)	-.1392E-2 (.0131)	.2156E-2	-.6459	.518	F-test 3.3169
Custa	5.6337 (.3208E-3)	4.4996	1.2520	.211	
Union	-.1003	.3631	-.2762	.782	
WTO	-9.4517	5.0952	-1.8550	.064*	

*Significant at the .05 level.. **Significant at the .10 level

Literature on the spillovers effects of FDI on productivity growth is not consistent among countries and industries. The following authors have performed analysis of the effects of FDI on productivity growth specifically in the Canadian industry. Their findings even though performed only for Canadian industries are still not consistent. Among the ones that have found evidence of positive foreign spillover effects on productivity growth are Bernstein (1998), and Gera (1999) while Rao (2001), and Rao and Tang (2001) did not find evidence of positive spillovers on productivity growth from MNEs to the domestic industry, however they did acknowledge that MNE's propensity to invest in new technologies is higher than their Canadian counterparts, and that their productivity is also higher than Canadian industries. Our results (table 4-21) are consistent with Rao (2001) and Rao and Tang (2000) findings. Our findings are of positive and significant evidence of domestic R&D investments to promote TFP growth. Meanwhile no significant evidence of foreign R&D investment was found. The importance of the result of this specific variable is that one of the main motives of countries to promote FDI is their expectations of growth in productivity that could arise from the presence of MNEs. This result does not suggest that the presence of MNE's have a negative impact on productivity, but it does suggest that productivity growth during this period is attributable to domestic firms and investment. The negative significant coefficient WTO suggests a slowdown in productivity growth for this industry after 1995. The Canadian food, beverages and tobacco sub industry is still going through a dramatic consolidation process that started since the early nineties. Four sectors account for over two thirds of the Canadian FB&T production (grains, dairy, meat and poultry). Currently, around 50% of the Canadian grain industry is controlled by one single firm with foreign capital (Agricore United Ltd.). Parmalat, an Italian firm controls over one third of the Canadian dairy

industry while the rest of the industry is controlled mainly by two other Canadian firms (Agropur and Saputo). The meat industry as well is controlled by Cargill Ltd. and Lakeside Packers (IBP) both of which are foreign companies. The productivity slowdown after 1995, reflected by the negative coefficient of WTO could be explained first by the finding of no evidence of spillovers effect from foreign companies to domestic firms, and second by the tendency to protect their competitive advantages (proprietary knowledge).

Table 4-22 Results: Effect of FDI on TFP growth, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-24.1193	34.5270	-.6985	.485	.7347
Own(-1)	20659.8 (.4918)	10368.5	1.9925	.046*	D.W. "d" statistic 2.5739
For(-1)	111351 (.3178)	44282.8	2.5145	.012*	D.W. "h" statistic 1.2223
FDI(-1)	-.290823E-2 (-.08894)	.129218E-2	-2.25065	.024*	F- test 6.306
Custa	.067047	4.3047	.015575	.427	
WTO	-9.5824	6.4492	-1.4858	.137	
Union	-.2931 (-.3457)	.2657	-1.103	.270	

*Significant at the .05 level.. **Significant at the .10 level

Table (4-22) contains the analysis of the effects of FDI on TFP growth for the FB&T sub industry (1987-2001). The results for this shorter time period analysis are not consistent with the ones found when analyzing the industry for a longer period (1972-2001). Positive and significant evidence was found for the domestic and foreign R&D investment variables, which account for the positive TFP growth in the industry. Total FDI inflows however were found to significantly slowdown productivity, which suggests that industry consolidation under foreign control accounts for increasing levels of FDI but FDI inflows are not proportional to the R&D investments exercised by MNEs.

The negative and significant coefficient for FDI is the result of increasing inflows of FDI (industry consolidation) but not consistent growth in productivity, which also could be explained by the increasing oligopoly power that MNEs are exerting in their sector of influence. Oligopolies objective is the maximization of profits. It cannot be expected of foreign R&D expenditures to move along with FDI inflows (actually FDI inflows follow a yearly positive trend, while yearly foreign R&D expenditures are variable). It is important to recall that most R&D investment by MNEs takes place in their home countries and that R&D investment represents comparatively a

very small amount of the total inward FDI. In addition, total FDI represents investments done by existing or new firms investing in the country and their total reported investment could range from building new infrastructure to investing in R&D.

Table 4-23 Results: Effects of FDI on TFP growth, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-129.595	207.628	-.6241	.533	.7502
Own(-1)	-.692875E-05 (-.5200)	.166047E-04	.417277	.676	**D.W. "d" statistic** 2.2697
For(-1)	.426076E-3 (.347385)	.721771E-04	5.9032	.000*	**D.W. "h" statistic** .4860
FDI(-1)	.687910E-04 (.44100)	.644416E-04	1.0674	286	**F- test** 3.4878
Union	-3.9878 (-.7843)	.4959	-8.0409	.000*	
Regulations	-2.82467 (-.0483)	2.7725	-1.0188	.326	
WTO	9.7328	1.7405	1.5918	.397	
Custa	-94.4985	12.0214	-1.8608	.451	
RHO	-.2445	.0355	-6.884	.000*	

*Significant at the .05 level.. **Significant at the .10 level

The analysis of the effects of FDI on TFP growth for the dairy products manufacturing sector (table 4-23) found positive and significant evidence of foreign R&D spillovers effects on TFP growth. Evidence of a negative and significant relation was found for unionization rates as to decrease productivity growth in the dairy sector.

Table 4-24 Results: Effects of FDI on TFP growth, grain manufacturing (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-2899.57	931.052	-3.1143	.002*	.7362
Own(-1)	.6883E-3 (.3035)	.2537E-3	2.5547	.011*	**D.W. "d" statistic** 2.4777
For(-1)	-.341151E-3 (-.5763)	.7441E-3	-.4584	.647	**D.W. "h" statistic** .8483
FDI(-1)	.0462 (.1533)	.0139	3.3098	.001*	**F- test** 16.39
Union	26.6117 (.2034)	9.0795	.9309	.437	
Regulations	-.175230 (-.0911)	.6356	-.2756	.787	
WTO	1.6158	10.5571	.1530	.878	
Custa	485.497	173.657	2.7957	.005*	
RHO	-6027	.0710	-8.4802	.000*	

*Significant at the .05 level.. **Significant at the .10 level

Table (4-24) contains the results for the analysis of the effect of FDI on TFP growth in the grain and oilseeds manufacturing sector. As with the previous analysis, results are not consistent among them. For the grain manufacturing sector the variables illustrating domestic investments and FDI inflows were found to positively and significantly affect TFP growth in the sector. Even though this sector has a foreign share of over 50%, the main foreign presence in it is the joint venture between ADM and UGG (currently Agricore United). Other companies such as Louis Dreyfus and Cargill Ltd. also own an important share of the sector. However, Agricore United is officially reported as a domestic company and its R&D investments could be being reflected as domestic investment. The only domestic company owning a significant share of the grain sector is currently the Saskatchewan Wheat Pool, which is under serious financial stress. It has been reported that grain infrastructure from the SWP has been sold to Agricore United.

Even though not the main objective of this research, appendixes (Y to AA) contain the results of the analysis for the effect of FDI on labor productivity growth for the industries under analysis. This exercise has the purpose of evaluating if there are similarities in the outcome of the analysis for the effects of FDI on TFP growth and labor productivity. Overall the outcomes for the analyses on labor productivity were consistent with the same analysis done for TFP growth. Three differences arose from the analysis for the FB&T sub industry on labor productivity growth (appendix Y), they are the findings of a positive and significant effect of foreign R&D spillovers on labor productivity growth, a negative and significant effect of unionization rates on labor productivity growth, as well as the lack of significant evidence of FDI inflows as a determinant for labor productivity growth. Both analyses were consistent in finding positive and significant impact of domestic R&D investment on labor productivity growth for the FB&T sub industry.

The analysis for the dairy manufacturing sector (appendix Z), was only consistent in finding a negative and significant effect of unionization rates on TFP growth and on labor productivity growth. The analysis on labor productivity growth for the dairy manufacturing sector found evidence of a positive and significant effect of FDI inflows as well as CUSTA on labor productivity growth. Its important to note the fact that both analysis found evidence of the foreign activity influencing either labor or TFP growth. The analysis on labor productivity growth for the dairy manufacturing sector suggests that FDI inflows positively impacted labor productivity growth. This effect could be attributable to increasing competition originated from the presence of foreign firms in the dairy sector. The same analysis but on TFP growth did not find evidence of

FDI inflows to affect TFP growth, but found evidence of foreign R&D spillovers on TFP growth for the dairy manufacturing sector.

Findings for the analysis of the effects of FDI on labor productivity growth for the grain and oilseeds manufacturing sector (appendix AA) are consistent with the analysis done on TFP growth (positive and significant evidence for domestic R&D and FDI inflows were found by both analyses). The only difference is the fact that the analysis of the effects of FDI on TFP growth found evidence of a positive and significant effect of CUSTA on TFP growth which was not found in the analysis for labor productivity growth for this sector.

Table 4-25 Effect of FDI on TFP growth using trade values, FB&T (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-8.3444	10.0066	-.8338	.404	.6927
Own(-1)	3512.69 (.1383)	4252.38	2.9260	.037*	D.W. "d" statistic 2.3216
For(-1)	2434.96 (.0642)	484.376	5.0222	.000*	D.W. "h" statistic .8913
FDI(-1)	.80871E-03 (.0943)	309806E-03	1.2105	.139	F- test 6.139
Union	-.4149 (.2943)	.1719	-.94118	.386	
Custa trade values	.0360 (.1197)	.01860	1.1073	.156	
WTO trade values	-.5605E-02 (.2681)	.3515E-02	-1.5944	.111	
RHO	-6027	.0710	-8.4802	.000*	

*Significant at the .05 level.. **Significant at the .10 level

Tables (4-25 to 4-27) contain the outcome of the analysis of the effects of FDI on TFP growth when the trade variables (CUSTA and WTO) were substituted from being dummy variables to being actual trade values. By performing these changes in our model we are expecting to be able to identify if MNEs who's parent company are located outside North America are generating R&D benefits to the Canadian industry, or if they are simply exploiting location advantages.

One difference arose when using trade values instead of dummy variables for the analysis of the effects of FDI on TFP growth for the FB&T sub industry (table 4-25). When using trade values, evidence of positive and significant effect for the domestic and foreign R&D variables were still present, however the FDI inflow variable lost its significant effect on TFP growth, while the trade independent variables continued to have no significant influence on TFP growth for the FB&T sub industry.

Table 4-26 Effect of FDI on TFP growth using trade values, Dairy manuf. (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-2.5421	4.8770	-.5212	.602	.7263
Own(-1)	-.2363E-04 (.3057)	.4485E-4	-.5270	.598	**D.W. "d" statistic** 2.4211
For(-1)	.24298E-03 (.2086)	.10749E-03	2.2605	.024*	**D.W. "h" statistic** .93913
FDI(-1)	.2097E-03 (.0633)	.10992E-03	1.9085	.056**	**F- test** 9.131
Union	.01397 (.4391)	.07308	.1912	.848	
Regulations	-.716102 (-.1309)	.7475	-.9579	.338	
Custa trade values	-1.3757 (.2578)	.4763	.88821	.409	
WTO trade values	.04995 (.1383)	.06050	2.8256	.004*	
RHO	-.5272	.10866	-4.8521	.000*	

*Significant at the .05 level.. **Significant at the .10 level

Table (4-26) contain the results for the analysis of the effects of FDI on TFP growth for the dairy manufacturing sector when substituting the dummy variables that illustrates trade agreements (CUSTA and WTO) for trade values. This analysis illustrates that MNEs are having a significant contribution to TFP growth in the dairy manufacturing industry. Evidence of foreign R&D spillovers as well as evidence for FDI inflows was found in this analysis. The significant effect for the WTO variable captures the effect that Parmalat (an Italian dairy firm who owns approximately 30% of the Canadian dairy manufacturing industry) could be having on productivity growth. The presence of Parmalat in Canada goes back to 1997 and is aggressively expanding in the Canadian dairy manufacturing sector. Parmalat is the main foreign player in the Canadian dairy industry.

The outcome of the analysis of the effects of FDI on TFP growth is consistent either when using trade values or dummy variables (to illustrate the trade variables CUSTA and WTO). Table (4-27) still illustrates that domestic firms are capturing no foreign R&D spillovers, however the influence of the CUSTA did have a positive effect on productivity growth. This effect could be mainly attributed to an increase in competition derived from the presence on MNEs. The significant coefficient for trade values for the CUSTA region is illustrative of North American firms being the main MNEs in this sector, however there is a lack of foreign R&D spillovers for the domestic industry.

Table 4-27 Effect of FDI on TFP growth using trade values, grain manuf. (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-35.7294	174.921	-1.704	.089*	.7316
Own(-1)	3.8239 (.3744)	18.014	1.8775	.060*	**D.W. "d" statistic** 2.5853
For(-1)	.161006E-02 (.1092)	.10642E-02	1.5128	.130	**D.W. "h" statistic** 1.3934
FDI(-1)	.01129 (.4684)	.0674	1.1411	.256	**F- test** 5.227
Union	-.2829 (.1264)	3.2022	-.0883	.930	
Regulations	-.471077 (-.0755)	.4541	-1.0371	.300	
Custa trade values	4.0282 (.2697)	1.0325	3.9013	.000*	
WTO trade values	3.7532 (.4633)	4.8083	.7805	.435	
RHO	-.3927	.2439	-1.6097	.107**	

*Significant at the .05 level.. **Significant at the .10 level

Table (4-28) provides a comparison of our findings for the analysis of FDI spillovers on TFP growth versus similar empirical work. Findings related to foreign R&D spillovers have not always been found to be either significant in this project nor consistent by different authors. However the significance found for the FDI inflow coefficient by several authors, suggests that productivity growth is not only influenced by R&D activities, but also by increasing competition derived by the presence of foreign firms, as well as for managerial skills through the migration of workers (Caves, 1974).

Table 4-28 Comparison of studies on the effect of FDI on TFP growth

	FB&T	Dairy	Grain	Caves, R. 1974	Sadik,A . et. al. 2001	Girma, S. et. al. 2001	Hanel, P. 2000	Bertschek,, I. 1995	Feinberg, S. et.al. 2001	Van Pottelsberghe et. al.. 2001
Domestic R&D Spillover	.891		.303				x		x	x
Foreign R&D Spillover	.317	.347					x	x		x
FDI inflows	-.088		.153	x	x	x				
Trade Spillovers							x	x		

Table (4-29) contains the results of the analysis for the MNE's choice of entry mode into the Canadian FB&T sub industry. The marginal effect coefficients in the logit model are estimates of the effect of a unit change in "X" on "the odds ratio". If a coefficient is positive, it means that an

increase in "X" tends to raise the probability that Y=1 (joint venture) and if negative it means that an increase in "X" tends to lower the probability that Y=1. Our findings suggests that there is significant evidence that greater corporation efficiency (know how), number of subsidiaries, and proximity to the host country increases the probability of a MNEs to acquiring domestic firms instead of joint venturing when investing in a foreign country.

The results for the analysis of the MNEs choice of entry mode support the "argument" contained in the theory of the MNE, where the firms (MNE) are willing to use their advantages when investing abroad as far as they can manage or guarantee the protection of their tangible and intangible assets. Our results are consistent with the lack of foreign R&D spillovers found in the analysis for the FB&T industry for the period (1972-2001) (table 4-21) in the sense that the lack of spillovers could be attributed (at least to some extent) to the choice of entry mode (acquisition) elected by highly firms with greater competitive advantages. However the same analysis for the period (1987-2001) did find evidence of foreign R&D spillovers (table 4-22), which could be explained by important FDI inflows since the beginning of the nineties of which several joint ventures agreements have been signed between domestic and foreign firms (i.e. UGG-ADM, Cargill-SWP, Coca Cola – Domestic distributors, etc).

Table 4-26 Results: MNEs choice of entry mode, FB&T sub industry

Independent variable (FB&T)	Regression Coefficient	Standard error	t-statistic	P-value	Marginal effect	Adjusted R^2
C	-7.0235	10.3403	-.6792	.497		.4521
LogAsset	.3430	.4509	.7608	.447	.042185	
Effic	-.55049E-6	.340469E-6	-1.6168	.106**	6.76844E-8	
Inter	-.0254	.01429	-1.7779	.075*	.003125	
Performance	1.2732	2.3472	.5424	.588	.1565	
Loct	-2.7886	1.3144	-2.1215	.034*	8.0332	
Regul	.9907	1.2432	.7968	.426	.9876	

*Significant at the .05 level. **Significant at the .10 level

4.8 FDI determinants in the absence of trade agreements

The purpose of this section is to simulate the trends of trade and TFP growth in the absence of FDI. However for the analysis of the determinants of FDI, the simulation will be done by eliminating the presence of trade agreements given their significant effect on attracting foreign

capital. The simulation for the analysis of the effects of FDI on TFP growth was done using the analysis that includes dummy variables to illustrate trade agreements in the model, and is done by setting the values of FDI inflows as well as the values of the foreign R&D spillover proxy equal to zero. Our analysis found evidence that Canada's increasing trade liberalization policies (WTO, CUSTA) have become a key observed factor by MNEs in determining the geographical location of their subsidiaries. Canadian foreign subsidiaries are being oriented not only to supply the domestic but also the North American markets taking advantage of the benefits implied in the free trade agreements where Canada takes place.

Figure (4-13) illustrates the importance of Canada's trade oriented policy in relation with FDI inflows into the Canadian agri-food industry. The significant impact of Canada's integration to the WTO is reflected in a steady FDI inflow in the FB&T industry since the mid nineties. The confidential nature of the FDI data for both the dairy and grain and oilseeds manufacturing sectors do not allow us to provide similar simulation figures.

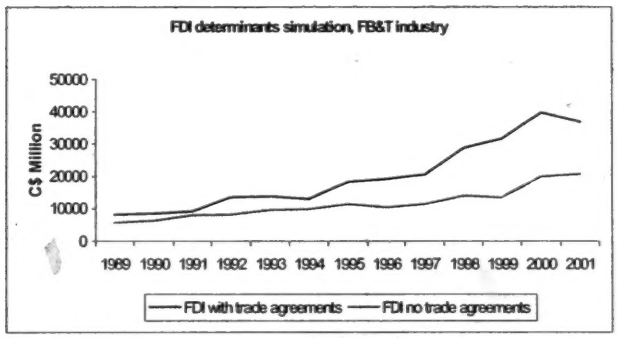

Figure 4-3 FDI determinants simulation, FB&T industry

4.8.1 Exports in the absence of FDI

As discussed in chapter two, exports are often the first mode of entering a new market, however its not always the most profitable trade alternative.

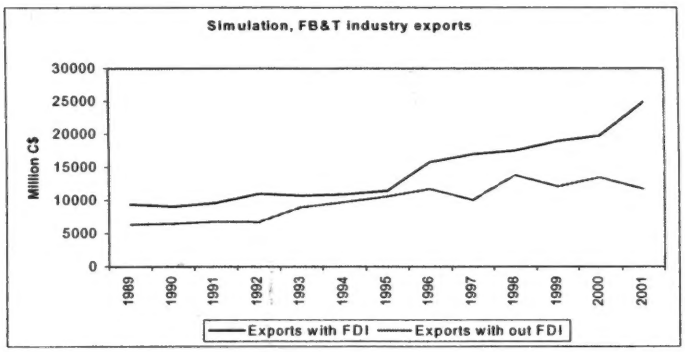

Figure 4-4 Exports simulation, FB&T industry

Our results found evidence of a complementary effect between exports and FDI for the FB&T industry and are consistent with other authors findings. It's important to note that the impact of FDI on FB&T exports has been important since the mid nineties, when Canada joined the WTO (Figure 4-4).

FDI impact on dairy manufactured product exports has not been as evident as with the FB&T industry as a whole. This fact can be explained by the presence of the supply management policy, which as discussed its not a trade oriented policy and sets dairy production quotas as well as prices which are usually higher than the international average price, MNEs could be mainly focused to the supply of the domestic market and taking advantage of product price markups. Our analysis, did not find evidence of FDI having a significant effect on dairy product exports (Figure 4-5).

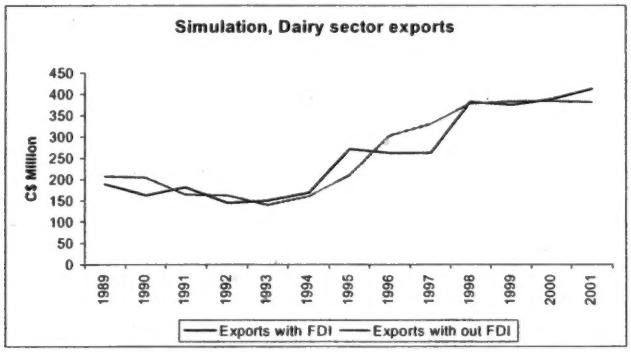

Figure 4-5 Exports simulation, Dairy sector

The CWB is openly trade oriented. The presence of MNEs and their increasing control of this sector has been reflected in a parallel grow of exports. Even though MNEs have been present in Canada since over two decades, the export gap illustrated in figure (4-5) suggests that both, FDI and trade agreements are playing an important role in Canadian grain and oilseeds manufactured products exports.

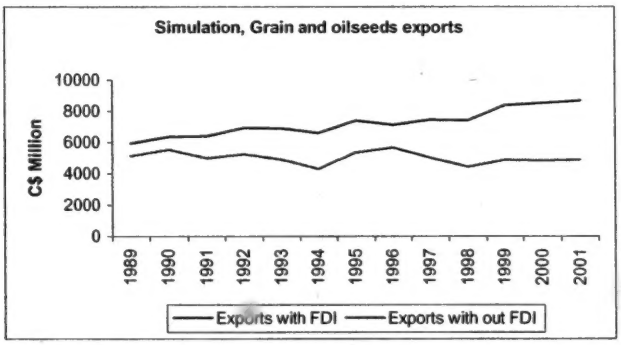

Figure 4-6 Exports simulation, Grain and oilseeds sector

4.8.2 Imports in the absence of FDI

Revised literature suggests that with growth in FDI inflows there is a complementary effect with both imports and exports due to intra firm trade. Contrary to a generalized perception, imports can also contribute to economic growth in that they allow specialization, i.e. by reducing costs of primary, intermediate and final products (Vaughan, and West; 1995).

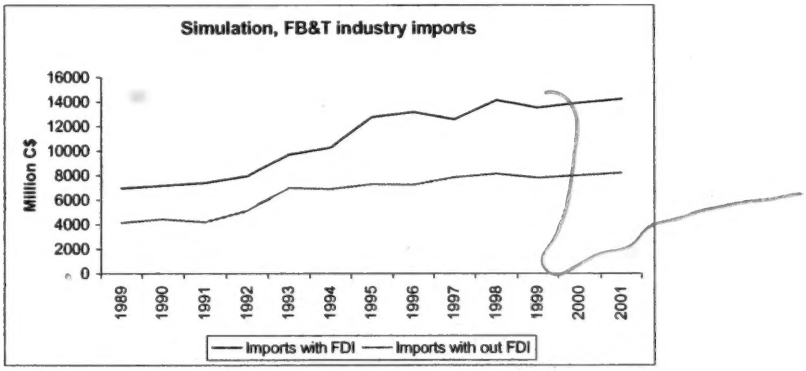

Figure 4-7 Imports simulation, FB&T industry

Our finding for the FB&T industry was of a significant effect of FDI inflows on industry imports. The simulation analysis suggests that growth of imports flows where to be almost "static" in the absence of FDI (figure 4-7).

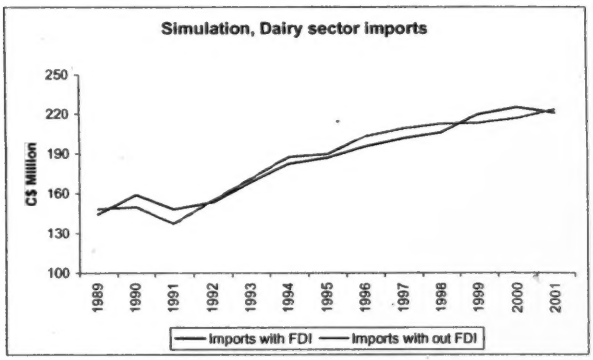

Figure 4-8 Imports simulation, Dairy sector

There are at least two identifiably reasons why imports for the dairy, and grain and oilseeds manufacturing sectors have not been greatly impacted by the presence (or absence of FDI). During our discussion of the supply management program in Chapter two, we discussed that the specifics of it did not allowed important amounts of foreign trade (due to high import tariffs, production quotas and regulated prices). The "lack"or low trade volumes of trade of dairy products are illustrated in figure (4-8). Our analysis did not find significant evidence of FDI inflows influencing import volumes for the Canadian dairy manufacturing sector.

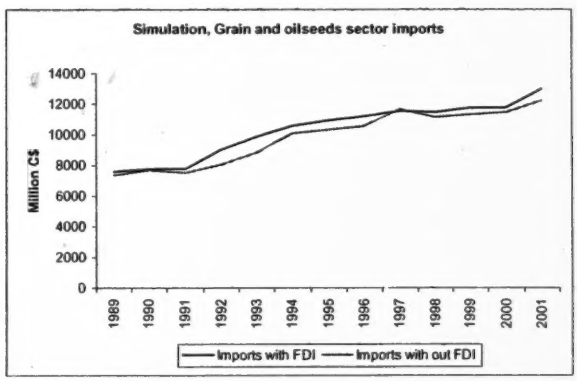

Figure 4-9 Imports simulation, grain and oilseeds sector

Canada has distinguished it self as one of the largest grain producers in the world, and parallel to the growth in production; the country has developed a competitive processing industry (with the presence of both, domestic and foreign firms). Given the excess availability of primary products and to the presence of a competitive manufacturing industry, it would be difficult for a foreign country to compete against the domestic characteristics of this industry. It is actually an export

oriented industry and the second largest agri-food sector in Canada. Our analysis did not find significant evidence of FDI influencing the sector import flows as illustrated in figure (4-9)

4.8.3 TFP growth in the absence of FDI

Through chapter II the fact that economies around the world are promoting FDI inflows was widely discussed. One of the main reasons for promoting FDI is the expectation of technological spillovers and therefore higher TFP growth levels and higher living standards for the host country. Our findings suggested that TFP growth for the FB&T sub industry is heavily dependent on domestic R&D, however foreign R&D has also its share of contribution to productivity growth. There seems to be a complementary effect of foreign R&D to domestic R&D activities particularly present since the late nineties where productivity has been higher than what it would have been with out FDI, this fact is consistent with increasing presence of foreign capital in the FB&T sub industry. (Figure 4-10).

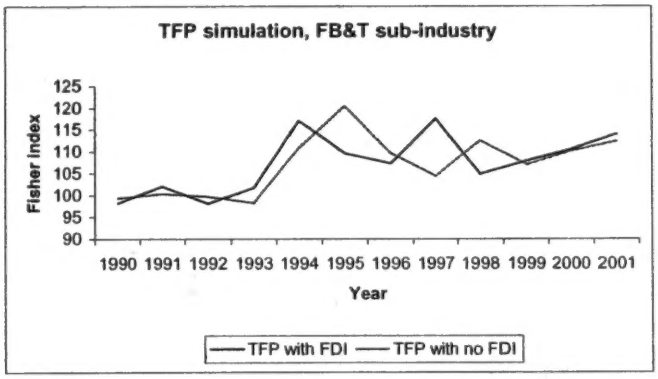

Figure 4-10 Simulation TFP growth, FB&T sub industry

However, when looking at the dairy sector, only foreign R&D was found to significantly contribute to productivity growth (Figure 4-11). This finding suggests a positive effect of FDI in the dairy manufacturing sector. The lack of significant evidence of domestic R&D contribution could be caused by the passivity of domestic firms that are relying excessively on government protection by import tariffs and high dairy prices causing a lack of incentive to increase productivity. Even though productivity growth for the dairy manufacturing sector has been "stable" for nearly a decade, its important to note that since the late nineties TFP growth was

greater with the presence of FDI. This fact is consistent with the presence of Parmalat as a major dairy manufacturing firm in Canada.

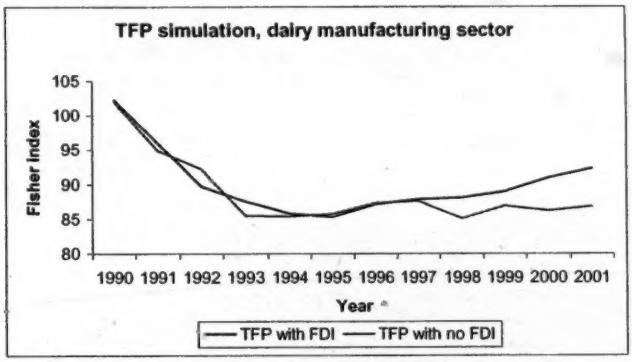

Figure 4-11 Simulation TFP growth, dairy manufacturing sector

Our results also suggests that the grain and oilseeds sector is relying in domestic R&D investment for technological innovation, however it has been complemented with the possible incorporation of technology from MNEs (the impact on TFP growth is given by FDI inflows and not on R&D expenditures) (Caves, 1974; and Girma, 2001). Figure (4-12), illustrates the importance of both, domestic R&D and FDI inflows on TFP growth for this sector, increasing consolidation during the late nineties (merger of UGG and Agricore) , suggests lower domestic R&D activity and a slowdown on TFP growth for the grain and oilseeds manufacturing industry.

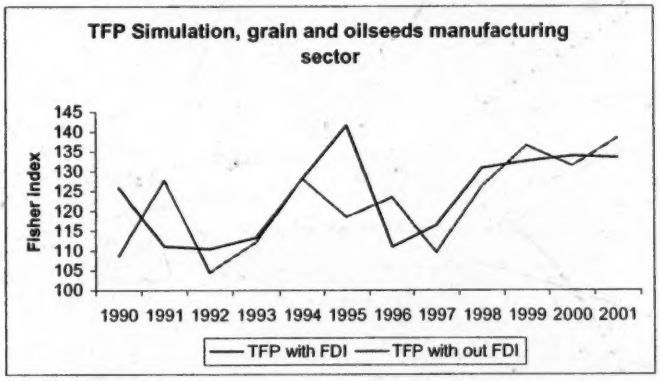

Figure 4-12 Simulation TFP growth, grain and oilseeds manufacturing sector

4.9 Summary

The results obtained from the analysis of the FB&T sub industry versus the dairy and grain and oilseeds product manufacturing illustrate that even though the sectors under analysis are components of the FB&T sub industry, each of them is influenced differently by most of the variables that were tested during this project. There was one exception; our results suggest that Canada's "openness to trade" does have a constant and significant impact in both, as a determinant of FDI or on trade in each sector. This fact illustrates that decisions taken for the FB&T sub industry have different outcomes (positive or negative) at the sector level of aggregation. Increasing levels of foreign capital and foreign market share in the FB&T sub industry, as well as in both sectors (dairy, and grain and oilseeds manufacturing) mainly during the late nineties were captured by the simulation exercise. The simulations, illustrated the importance of foreign spillovers for the FB&T sub industry and dairy manufacturing sector mainly in the late nineties in which their contribution to TFP growth overwhelmed TFP growth in the absence of FDI. The simulation also illustrated the lack of foreign R&D spillovers for the grain and oilseeds manufacturing sector. Results of the analysis for the MNEs choice of entry mode suggests that MNEs investing in the Canadian agri-food industry base their entry mode decision on the protection of their competitive advantages (knowledge) as well as on risk aversion.

Chapter 5 CONCLUSION

Previous empirical studies related to the effects of FDI on domestic industries have focused on the manufacturing industry in aggregate restricting the ability to formulate policies for targeted specific sectors possessing unique characteristics. This research has the objective of evaluating the effects of FDI on the Canadian FB&T sub industry as well as on two specific sectors governed under strict regulatory policies. This project would allow us to illustrate whether within an industry, the effect of specific policies can have different outcomes, and that the differences in outcomes can be greatly influenced by the sector specific attributes.

During the last two decades, MNEs have been actively investing in the Canadian FB&T sub industry. MNEs are aggressively investing in highly regulated sectors. The dairy, and grain and oilseeds product manufacturing sectors provided us with two specific examples, first the regulatory environment governing each of them are of a different nature. For example, the dairy sector supply management regulations lead to a non-trade oriented sector, while regulations for the grain and oilseeds sector are openly trade oriented. The second is the fact that MNEs in both sectors account for a significant share of the domestic market (estimations suggests that MNEs account for approximately 50% of the market share of each sector).

This research has four main objectives: The first is to test for the determinants of FDI. The evaluation of the effects of FDI on trade (imports/exports) and productivity growth is our second and third objectives. The fourth objective is to test for the MNE's choice of entry mode into the Canadian agri-food industry. By performing this research at a sector level of empirical analysis we were expecting to capture with more accuracy the effects of FDI on specific sectors rather than on the aggregated industry (FB&T). By evaluating agri-food sectors under strict regulatory policies such as supply management (dairy manufacturing) and the Canadian Wheat Board (grain and oilseeds manufacturing sectors) we attempted to capture their effect on FDI determinants, as well as their effect on trade, productivity growth, and on the MNEs choice of entry mode.

Specifically, the evaluation of the effects of FDI in the Canadian agri-food industry was achieved by:

1. Evaluating the determinants of inward FDI into the Canadian agri-food industry.
2. Evaluating the impact of FDI on trade by looking at the complementary or substitute effects of FDI on the Canadian agri-food industry imports and exports.

3. The impact of FDI on TFP growth was evaluated by determining if foreign R&D spillovers were affected by the presence of MNEs, as well as by evaluating if FDI inflows had some effect on productivity growth.
4. The MNEs choice of entry mode into the Canadian agri-food industry was also a part of this project. MNEs efficiency levels, profitability, international experience, and geographical location were evaluated as a way to illustrate if MNEs based the entry mode decision on the protection of their competitive advantages.

5.1 Analysis outcome

a) Outcome for the analysis of the determinants of FDI:

The cointegration analysis was intended to identify the presence of unidirectional, bi-directional or the lack of causal relations among the dependent and independent variables. Findings from the cointegration analysis for the FB&T sub industry were of a unidirectional causal relation between sector size and FDI inflows. This finding would have implied the possibility of finding significant evidence of sector size as an FDI determinant for the FB&T sub industry. However, the lack of significant evidence of sector size as a determinant of FDI could be attributed to the fact causal relations are estimated using univariate regressions, while our models include multiple variables in the estimation. The cointegration analysis for the determinants of FDI in the dairy manufacturing industry found evidence of a unidirectional causal relation between past FDI values, as well as input prices with FDI inflows. These results support the finding of significant coefficients for these variables as FDI determinants for the dairy industry. As for the analysis for the grain and oilseeds industry, evidence of a unidirectional causal relation for unionization rates to granger cause FDI inflows was found. The lack of significant evidence of the unionization rate variable as an FDI determinant for the grain and oilseeds sector might also be explained by the use of multivariate regression in our estimations.

At an aggregate industry level of analysis (FB&T), our findings suggest that the Canadian trade oriented policies are having a significant positive influence in attracting foreign capitals into the FB&T sub-industry. The significant coefficient for import tariffs as a determinant of FDI, suggest the possibility that MNE's are attracted to invest in highly regulated sectors; specifically in those which include high import tariffs as a part of their regulatory environment (supply management in the dairy manufacturing sector, and other sectors under the same regulatory environment). The

fact that MNEs could be interested in investing in sectors in which domestic firms are protected against international trade, suggests that FDI may be market seeking oriented. According to Brouthers (1995), MNEs which invest in highly developed countries tend to be market seeking and the relationship between FDI and trade becomes one of a complementary nature (as supported by the outcome of the analysis of the effects of FDI on imports for the FB&T sub industry). However given that the FB&T sub industry is aggregated from several sectors, the analysis does not allow us to accurately identify which sectors are obtaining the greatest FDI inflows based on their regulatory structure.

Sector size was found to have a positive and significant effect as a determinant of FDI in the Canadian dairy manufacturing sector. In our analysis, sector size is referred to as the sector's contribution to national GDP. The importance of this finding is the fact that under the supply management system, the CDC forecasts the yearly dairy consumption for the domestic market allocating production quotas (kg of butterfat a year) to each specific province. At the same time, the CDC regulates industrial milk prices. The combination of these factors and the high import tariffs for dairy products result in high dairy manufactured product prices and therefore in a significant contribution from this sector to the national GDP. The lack of international dairy products in the domestic market, as well as the regulation of milk production volumes, guarantees attractive market prices for processed dairy products. By positioning itself as one of the main dairy product manufacturers in Canada, Parmalat could be taking advantage of significant markups in the price of dairy manufactured products arising from the regulatory environment. Currently, Parmalat is continuing its expansion plans by aggressively acquiring existing dairy firms. This expansion in a "limited domestic market" (due to the regulations of dairy production) could be explained by an attempt to control the market based on the exploitation of domestic advantages given by the regulatory environment and also based on their superior technology (as will be discussed in further detail in the analysis of the effects of FDI on TFP growth). The exploitation of domestic advantages by Parmalat, as well as the exploitation of their proprietary knowledge as a strategy to penetrate the domestic market is supported by Dunning's(1970) theory of the MNEs which is the origin of this research. The lack of international trade in the dairy manufacturing sector imposed by the supply management system also implies that Parmalat's objective of investing in Canada is market seeking, and is consistent with Brouther's (1995) empirical work.

Historically, Canada has positioned itself as one of the main grain producers in the world, over 50% of Canada's grain is exported and it accounts for about 20% of total world grain exports. MNEs have been established in Canada for several decades, however a dramatic market share takeover by MNEs started taking place by the end of the eighties, and by the mid nineties MNEs already managed to control over 50% of the domestic market. The significant coefficient for the Custa variable as an FDI determinant, suggests that MNEs perceive the open border policies not only as an opportunity to supply a larger market with processed products, but also to profit through elevation tariffs. Higher input costs were found to discourage FDI inflows in this sector. Contrary to the supply management system, the CWB does not regulate grain production, implying that even though the grain product pricing is done by the CWB, domestic grain prices still have to be competitive enough to be sold to international markets, leaving small opportunities for significant price markups as with dairy manufactured products. Import tariffs were found to have a positive and significant effect as an FDI determinant for this sector. The fact that Canada has become self sufficient in grain production and grain products, and that a significant share of Canada's grain production is sold to international markets, suggests no need for high import tariffs. It is the combination of a highly productive sector, together with moderated import protection what could be perceived by MNEs as an exploitable competitive advantage.

b) Outcome for the analysis of the effects of FDI on trade:

The second objective of this research was to evaluate the effect of FDI on trade; mainly the complementary or substitution relationship between trade and FDI inflows. Overall, the Canadian trade oriented policies undertaken since the late eighties have had a positive impact on trade relations at all levels of industry aggregation. For the analysis of the effects of FDI on the FB&T sub-industry exports, findings were of a positive and significant effect of FDI, subsidies and trade agreements on FB&T exports. Our findings suggest the existence of a complementary interaction between exports and FDI inflows. The complementary effect between FDI and exports, together with the significant coefficient for trade agreements, suggests that MNEs are exploiting Canadian location advantages, given that the free trade agreements are allowing MNEs to supply the entire North American market. The analysis for the grain and oilseeds sector found similar results to the FB&T sub industry. Evidence of a complementary effect was also found for the grain and oilseeds manufacturing sector, where trade agreements are also playing a significant role in the

sector's export performance. The positive and significant effect of both variables was expected given that the grain and oilseeds sector regulatory environment (CWB as a single desk seller) is openly trade oriented. The cointegration analysis for the effects of FDI on trade for the grain and oilseeds sector, found evidence of a unidirectional causal relation for past export values to granger cause present exports. The lack of significant evidence for the past export values variable as a determinant of current exports could also be attributed to the use of a multivariate regression model in our analysis. No evidence of a complementary or substitute relation was found for FDI inflows and exports for the dairy manufacturing sector. This lack of complementary or substitution relation for FDI inflows and dairy products exports could be attributed to high domestic prices for dairy products. As discussed at the beginning of this chapter, high domestic prices are a consequence of the supply management system and discourage exports given that domestic prices are higher that international dairy product prices. The positive and significant coefficient of WTO and trade disputes captures the effect of a dairy pricing policy that took place during the late nineties up to the year 2002 (as discussed in chapter 3). In that period, the CDC established a special milk classification that would allow producers to export fluid milk into the U.S. However the trade dispute variable captured the effect of U.S. dumping disputes filed against Canada at the WTO.

The analysis to test for the effect of FDI on FB&T imports did find significant evidence of a complementary effect between FDI and imports, which could be attributed to increasing levels of intra-firm trade facilitated by the presence of trade agreements. No significant evidence of a substitute or complementary relationship was found for FDI inflows and dairy product imports. However the supply management system influence was captured by the negative and significant effect for the dairy import tariffs variable. The negative coefficient of import tariffs was expected based on the fact that the supply management system does not promote international trade.

The cointegration analysis for the effects of FDI on dairy imports, found evidence of a unidirectional causal relation for past FDI values to granger cause present exports. The lack of significant evidence of a complementary effect between dairy imports and FDI could again be attributed to the use of a multivariate regression model in our analysis.

No evidence of a complementary or substitute effect was also found for the grain and oilseeds sector imports and FDI inflows. The fact that the existing regulations for this industry do not promote important protectionist measures against trade could have implied a complementary

relationship between grain imports and FDI inflows. However high production and efficiency levels, as well as the moderate import tariff protection against grain and oilseeds products seems to provide enough import protection for this sector. The finding of a negative and significant evidence for the grain and oilseeds import tariffs variable on imports is supported by the finding of significant unidirectional causal relation between import tariffs and import values (it is said that import tariffs granger cause grain and oilseeds products imports).

c) Outcome for the analysis of the effects of FDI on TFP growth.

The main discrepancies of the comparison between the industry and the two sectors took place while analyzing the effects of FDI on TFP growth. The main difference lay on the fact that domestic and foreign spillover effects were found for the FB&T sub industry (as did previous empirical evaluations i.e. Hanel, 2000). However in the dairy sector only foreign R&D spillovers were found to positively influence TFP growth and no significant contribution of domestic R&D investments to TFP growth was present. The opposite effect was found for the grain sector. We did not find evidence of trade agreements (WTO and CUSTA) influencing TFP growth for the FB&T sub industry, however we did find significant evidence for the grain and oilseeds manufacturing sector. Specifically for the grain and oilseeds manufacturing sector, by using trade values to substitute for the use of trade dummy variables in this model, we were able to identify that North American MNEs are taking advantage of Canada's competitive advantage. The lack of positive evidence of foreign R&D spillovers in the grain and oilseeds sector, together with the significant evidence of the CUSTA variable, suggests that MNEs (mainly U.S. MNEs) are taking advantage of lower production costs in Canada and supplying not only the domestic but all the North American market (U.S., Canada and even Mexico). This fact could be supported by the significant coefficient found for input costs (cost of wheat) in the analysis for the determinants of FDI for the grain and oilseeds sector. With regards to the dairy sector, the positive and significant coefficient of WTO (in both analyses, with dummy variables or with trade values) suggests that overseas MNEs are also taking advantages of Canada's geographical advantage, however the main difference with respect to the grain and oilseeds MNEs is the fact that for the dairy sector, domestic firms are able to capture R&D spillovers. The aggregation of all the sectors under the FB&T industry would have suggested that positive R&D spillovers were being captured by all FB&T sub sectors, however our analysis allowed us to specifically point out the presence or lack of foreign R&D spillovers for the dairy, and grain and oilseeds manufacturing sectors.

Results from the analyses of the effect of FDI on both, TFP and labor productivity growth proved not to be substitutes across the industries under analysis. However, several similarities were found in the analysis for the FB&T sub industry, as well as for the grain and oilseeds manufacturing sector. The output for the analysis of the dairy manufacturing sector was not consistent at all when evaluating the effects of FDI on TFP growth as well as on labor productivity growth.

The overall increasing levels of trade derived by FDI inflows at the sub industry level and sector level favors the exploitation of local advantages as well as their competitive advantages (proprietary knowledge); in some cases without disseminating it to their competitors (grain and oilseeds products manufacturing). The protection of their competitive advantage is being reflected in the productivity slowdown in the FB&T sub industry in the last decade.

Industry regulations were found to significantly affect trade performance in the dairy manufacturing industry. High import tariffs were found to significantly slowdown dairy product imports. We have to remember that the regulatory environment governing the dairy industry is structured by regulating dairy production through production quotas (kgs. of butterfat per year), the regulation of dairy prices, and the presence of high import tariffs for dairy products.

It is important to point out the fact that one of the main reasons why governments promote FDI inflows is the belief in technological gains and therefore productivity growth. As discussed, our findings suggest that in some cases (FB&T and dairy manufacturing), there is evidence of foreign R&D spillovers, however these observed foreign spillovers are not being reflected at a sub-industry or sector steady productivity growth. Actually productivity growth for both sectors and the sub industry has been either decreasing or having almost "invisible growth" mainly since the mid nineties for the FB&T sub industry and the grain and oilseeds manufacturing sector; while the lack of productivity growth in the dairy industry has been persistent since the beginning of the nineties. Therefore FDI has clearly not contributed to solving the problem of lack of productivity growth in the Canadian agri-food industry (Figure 3-1).

The contribution of FDI in increasing levels of trade is more significant, however the credit should be shared with the influence that Canadian trade oriented policies have also had on trade. The complementary effect of FDI and exports and imports for the FB&T sub industry is always complemented with the significant influence of trade agreements.

d) Outcome for the analysis of the MNEs choice of entry mode.

As a complement to the previous discussion, findings from the analysis of the MNEs choice of entry mode suggests that MNE's with higher efficiency (know how, managerial skills), international experience, and the fact of being closer to the host country would rather acquire a domestic firm instead of joint venturing with it. These findings suggest that MNEs value the protection of their competitive advantages and are not willing to spread them to their local competitors. Risk is also observed by MNEs, the geographic distance implies not only higher challenges to management, but cultural differences that has been proven in different studies to influence the decision to invest, as well as the decision of the mode of entering a new market. Overall our result suggests that there could be a link between the choice of entry mode and the possibility for domestic firms of capturing foreign R&D spillovers. The fact that most FDI in the Canadian agri-food industry has taken place as acquisitions, suggests that MNEs feel confident enough that their competitive advantages together with the exploitation of domestic advantages justify the risks and costs of an overseas operation (as stated in Dunnings eclectic theory of the MNE). By acquiring domestic firms, MNEs do not share their competitive advantages through joint ventures or even through licensing or franchising agreements. No significant evidence was found for the regulatory environment variable as a determinant of the MNEs choice of entry mode. The lack of significant evidence for this variable could be supported by the fact that most FDI investment in the FB&T sub industry has taken place by acquisitions.

Overall, from this research we conclude that FDI implications on the Canadian agri-food industry have positively influenced trade flows; however its contribution to productivity growth still questionable. We have to recall the beginnings of this research where we discussed that productivity growth influences the living standards of the population. There is a productivity growth slowdown affecting in consequence the living standards for people making a living from these sectors. The continuous consolidation process in this industry as well as the presence of MNEs still raises questions of the effects of Canadian firms losing control of the agri-food industry. As a result increasing productivity growth rates in these Canadian sectors under the control of oligopolies is not a certainty. The desegregation of the analysis also allowed us to capture the effects of FDI in Canadian agri-food sectors in the presence of specific regulatory environments. Our results suggest that the supply management system has an influence as a FDI determinant or on trade, while the CWB influence is less notorious. The fact that our analyses

were done for sectors belonging to the same sub-industry, in which both were under specific regulatory environments, provides evidence that even close similaties do not make FDI impacts consistent through the industries under analysis. Policies then should be designed not for aggregate industries, but according to the specifics of each industrial sector.

5.1.1 Policy implications

The international integration tendency of the Canadian industry through FDI is a major reason for the domestic government to re-examine its present policies towards FDI, trade, and even industry support programs. The strength shown by MNEs is supported by their success when competing against domestic firms; at the same time this success may be exerting pressure on policy makers to maintain the protection of the domestic industry (i.e. supply management and CWB). Parallel, protective policies are against the free trade agreement principles that have greatly influenced foreign capital inflows into the Canadian agri-food industry. Policy makers are facing the challenge of transferring the cost of the protection for some of the domestic agri-food sectors to consumers, or to stop protecting already overprotected industries in exchange for possible economic benefits for consumers.

The MNEs perception of Canada's trade relations with North America is clearly being exploited. They certainly will contribute to the Canadian agri-food industry becoming one of the fourth top agri-food exporter countries in the world. However Canada's support for trade liberalization through NAFTA and WTO is being challenged by present trade disputes that are clearly affecting MNEs operations. Canada must speed its efforts to bring agri-food trade equality with U.S. otherwise MNEs perception of Canada as the MNEs subsidiaries distribution point for the North American market could be in jeopardy and future FDI inflows into the agri-food industry could be at risk. As Canada continues to be a trade oriented country and a main FDI attractor, we can expect an even greater industry concentration tendency (larger manufacturing plants and oligopolies) and weaker domestic market control. However FDI inflows should be big enough to upset the cost of losing domestic firms as well as the cost of losing control of the domestic market. An alternative to having increasing domestic participation is the development of policies that encourage joint ventures, these policies should enhance increasing R&D support programs or tax incentives, a decisive determination to defend and enhance trade agreements, and environmental policies.

In general, our findings suggest that Canada's openness to trade is the main determinant of FDI inflows. If Canada's choice is still in favor of promoting FDI inflows, Canada should continue with an open border policy. FDI inflows together with a trade oriented economy have strengthened the trade balance for the industries under analysis, and MNEs are certainly exploiting Canada's location advantages. Canada's efforts towards increasing R&D investments in the FB&T sub industry should also continue. R&D subsidy programs such as the Matching Investment Initiative (MII) should contribute to reducing dependence in foreign technology and would mainly contribute to increasing domestic firm's competitiveness.

The presence of highly regulated sectors in Canada's agri-food industry imposes a double moral challenge. First, the trade orientation of the CWB, as well as the weak trade protectionist measures for the grain and oilseeds manufacturing sector, seems to have successfully created a self sufficient sector with the active participation of domestic and MNEs firms. The elimination of subsidies and elevation tariff controls has created a more competitive grain and oilseeds market (a fully competitive market would require the elimination of the CWB). The grain and oilseeds sector has managed to be technologically self sufficient (TFP growth was mainly attributed to domestic R&D and foreign competition). According to our results, the presence of MNEs in this sector has been a benefit to trade. Given the trade oriented single desk seller regulation, this complementary effect of FDI with exports could be partially attributed to the regulatory environment. The lack of foreign R&D spillovers for this sector might not be seen as detrimental given that evidence of a positive effect of FDI inflows to TFP growth was found in this analysis. This may imply that indirectly increasing domestic competition derived by increasing foreign presence is not allowing domestic firms to stop their innovative efforts. In addition the pressure of marketing a significant share of their production internationally and having to compete against similar regulatory organizations imposes enough pressure for the sector to be under a continuous improvement management and production process. Even though there is a sense of nonconformity among a number of producers due to the presence of the CWB regulations, our results suggests that the presence of FDI, together with the regulatory environment has had a positive effect on the Canadian grain and oilseeds manufacturing sector. The disappearance of the CWB could result in lower producer prices, a dramatic industry concentration dominated by foreign MNEs, and therefore a slowdown in productivity growth.

The supply management system has successfully managed to protect the domestic dairy industry by controlling prices, production volumes, and imports of dairy products. However it has also successfully managed to provide few incentives for R&D activity among domestic firms. The lack of significant foreign competence (until Parmalat invested in Canada), and high prices hosted by the paternalistic supply management system lead to lethargic annual TFP growth rates. The presence of Parmalat and other MNEs has had immediate effects on TFP growth (TFP growth for the dairy manufacturing sector was mainly attributed to foreign R&D investment). This implies that by promoting FDI inflows, domestic dairy firms are being able to capture foreign R&D spillovers. At the same time, MNEs seems to value the level of protection provided by the supply management system.

Based on the previous discussion, should Canada want to increase competitiveness in the dairy manufacturing sector, FDI inflows should still be promoted, and the supply management system should prevail. By eliminating the supply management system, domestic firms will be without protection against more competitive foreign players, and they would also be deprived of capturing foreign R&D technology derived by FDI. Domestic producers should also realize that the supply management system goes against all new rules of international trade embedded in the NAFTA and WTO agreements, and MNEs could also be attracted to invest in the country as a way to control the domestic market waiting for the ultimate fate of both, the supply management system, and the CWB. Given the foreign R&D benefits derived by MNEs operating in the dairy sector, domestic firms should take advantage of these spillovers, while efforts to promote domestic R&D activities should continue in order to increase domestic firm's competitiveness. Given that there is also evidence of MNEs taking advantage of the domestic regulatory environment, policy makers should encourage important R&D economic resources for both domestic and foreign firms who would be willing to operate under a joint venture structure in the domestic market.

5.2 Further studies and limitations

Increasing inflow levels of FDI and the complementary effect of FDI on exports and imports for the FB&T sub industry suggest the possibility of FDI inflows to be higher than trade values for the Canadian agri-food industry. This possibility would greatly affect the performance and contribution to the agri-food trade balance of small and medium size firms of Canada's agri-food industry. Parallel to trade issues, MNEs will have a stronger say in technological development. The protection of proprietary knowledge by MNEs would compromise the ability of domestic

firms to compete unless important efforts towards developing domestic technologies are implemented. An important effect of trade liberalization is the fact that sales by foreign subsidiaries are overwhelming exports affecting not only industry performance, but causing serious structural changes (in the number of establishments, ownership structures, and mainly creating oligopoly structures). The fact that MNEs are increasing the number of subsidiaries worldwide to supply host country markets, and their ability to minimize transaction costs with respect to trade (Vaughan and West, 1995) suggest the possibility that eventually FDI inflows could be greater than exports, the analysis of the impact in the Canadian economy/industry of this trend is a recommendation for further research. The impact of oligopolies controlling the domestic agri-food industry, its impact on production, consumer and producer prices, and its effects on the number of domestic establishments and therefore employment should also be subject to a detailed analysis and is recommended for further research. Through this thesis, several theories related to the evolution of the firm into a MNE were described. This research approach to test for the effects of FDI on TFP growth was based on the assumption that MNEs would protect their competitive advantages from their competitors, given that a combination of them with domestic advantages is what would overcome the cost of investing abroad (Dunning's theory of the MNE). Similar analyses based on different theoretical approaches such as diminishing returns to management included in Coase's theory of the firm are also a recommendation for further studies. In order to identify MNEs tendency to protect their proprietary knowledge from competitors, in the analysis for the MNEs choice of entry mode the "log assets" variable was used to test for Dunning's eclectic theory of the MNE, which is based on the protection of knowledge. However the use of the "squared assets" value would allow testing for Coase's Theory of the firm, which is based on the argument of "diminishing returns to management", this topic is also a recommendation for further studies. In addition, similar studies can be done for different agri-food sectors currently under similar regulatory environment.

Our task of evaluating the effects of FDI at the furthest possible level of industry desegregation was based on the fact that important FDI inflows have been entering highly regulated agri-food sectors, with some of the previously discussed effects having influenced in opposite directions domestic business and industry performance. The existing oligopoly structure in several agri-food sectors imposed the challenge of collecting data at a sector industry level. Furthermore, the lack of enough observations for these analyses imposed a challenge towards the achievement of our objectives and was a limitation towards comparing our findings for the FB&T sub industry

for the period 1972-2001 with the sectors under analysis. An additional limitation for this research was the existing oligopoly structure in both sectors under analysis (limited number of foreign firms in each sector). This fact did not allow us to collect enough observations to test for the MNEs choice of entry mode at a further industry level of desegregation than for the FB&T sub industry. The R&D proxies used in our analysis do not capture the possible intra-industry spillovers effect on TFP growth and labor productivity growth; the lack of enough sector data imposed this limitation on our analysis. Import tariff values used through this thesis were estimated using a weighted average import tariff for every industry, which could fail to capture the entire impact of tariffs on the analysis. An additional limitation to this analysis was the use of the regulated grain elevation tariffs to illustrate the regulatory environment governing the grain and oilseeds sector. However these values may fail to entirely capture the effect of the single desk seller regulatory environment in this analysis. The upcoming years will contribute to enhance the industrial sector data database and certainly would contribute to the performance of more accurate analyses. However our contribution is to allow, producers, industrials, and policy makers to observe with certain degree of accuracy the effects of FDI on domestic industrial sectors.

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Appendix A

Unit root test, for the variables used in the FB&T sub industry

Dep. Variable (FB&T)	Ind. Variable	t statistic	P value	No. lags
FDI		.-1.2563	.8983	10
	Sector	-2.5055	.3052	8
	Int. Rt.	-1.8293	.6904	9
	FDI(-1)	-.2811	.9899	2
	Tariff	-2.5523	.3023	2
	Subs	.1502	.9954	2
	Fuel	-2.0144	.5935	2
	Labour	-2.4365	.3469	2
	Taxes	-2.3600	.4010	2
	Union	-2.6591	.2534	10
Expr		-2.0394	.5797	10
	Expr(-1)	-1.5724	.8030	10
	Exchge	-2.1678	.5079	10
Imp		.3995	.9966	10
	Imp(-1)	-1.2625	.8968	2
	Tariff	-2.4347	.3613	2
TFP		-1.7137	.7447	10
	Own(-1)	-2.2671	.4522	10
	For(-1)	-2.0766	.5591	9

Appendix B

Cointegration test, determinants of FDI for the FB&T sub industry

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
FDI	-1.4655	.9269	10
Sector	-4.5164	.0052*	10
FDI	-2.2500	.6548	2
Int. rate	-1.5420	.9124	9
FDI	-2.9892	.2684	10
FDI(-1)	-1.5236	.9161	2
FDI	-2.6877	.4173	10
Tariff	-2.5284	.5045	2
FDI	-2.2939	.6321	10
Subs	-1.3874	.9396	10
FDI	-.9336	.9812	5
Fuel	-1.9984	.7723	2
FDI	-.7813	.9874	5
Labour	-2.8530	.3319	2
FDI	-.6822	.96026	7
Taxes	-2.5232	.5074	3
FDI	-1.2263	.9597	5
Union	-2.3425	.6063	5

*significant at the .05 level

Appendix C

Cointegration test, effects of FDI on exports for the FB&T sub industry

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Expr	-1.3065	.9506	6
Expr(-1)	-1.4632	.9273	6
Expr	-1.8393	.8322	10
FDI(-1)	-2.0958	.7298	5
Expr	-2.3320	.6119	10
Exchge	-1.8315	.8348	9
Expr	-2.5644	.4846	2
Subs	-2.4729	.5352	3

*significant at the .05 level

Appendix D

Cointegration test, effects of FDI on imports for the FB&T sub industry

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Imp	-1.3049	.9508	10
FDI(-1)	-2.4892	.5262	2
Imp	-2.5816	.4751	2
Imp(-1)	-2.7796	.3688	2
Imp	-.6726	.9905	2
Exchge	-2.0107	.7645	3
Imp	-.7067	.9896	2
Tariff	-2.4498	.5479	2

*significant at the .05 level

Appendix E

Cointegration test, effects of FDI on TFP growth for the FB&T sub industry

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
TFP	-1.9158	.8043	2
Own(-1)	-2.4870	.5274	3
TFP	-2.1738	.6930	2
For(-1)	-1.7137	.5797	3
TFP	-2.5656	.4839	2
FDI(-1)	-1.4283	.9332	2
TFP	-2.4864	.5277	2
Fuel	-1.5731	.9058	2
TFP	-2.6581	.4332	2
Union	-2.0477	.7513	5
TFP	-2.4596	.5464	2
Labour	-2.3675	.5929	2
TFP	-2.3037	.6269	2
Taxes	-2.2780	.6404	3
TFP	-2.5457	.4949	2
Int.rt.	-2.6855	.4184	2

Appendix F

Unit root test for variables used in the dairy sector analysis

Dep. Variable (FB&T)	Ind. Variable	t statistic	P value	No. lags
FDI		-2.6240	.2689	2
	FDI(-1)	-2.9365	.15070	4
	Sector	-2.62407	.2689	4
	Tariff	-1.9693	.6180	2
	Subsidies	-1.1168	.9262	2
	Regulations	-1.6553	.7700	3
	Taxes	-2.3600	.4010	2
	Union	-2.6591	.2534	10
	Fuel	-1.9467	.6301	4
	Input cost	-1.5721	.8031	4
Export		-1.9858	.6091	4
	Export(-1)	-1.4650	.8407	4
	Exchange	-2.7374	.2208	4
Import		-.8921	.9569	3
	Import(-1)	-2.2917	.4385	2
	Tariff	-1.9693	.6180	2
TFP		.3620	.9879	2
	Own (-1)	-1.9754	.6147	2
	For (-1)	-1.2637	.8966	4

Appendix G

Cointegration test for the analysis of the determinants of FDI in the dairy sector

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
FDI	-2.7880	.3645	2
FDI(-1)	-4.8864	.0013*	4
FDI	-2.0872	.7337	2
Sector	-3.8555	.0410*	4
FDI	-2.8475	.3346	2
Tariff	-2.1448	.7069	2
FDI	-3.0715	.2338	2
Subsidies	-1.8016	.8446	2
FDI	-2.6135	.4575	2
Regulations	-2.0894	.7327	2
FDI	-2.6025	.4636	2
Union	-2.1874	.6804	2
FDI	-2.9722	.2759	2
Taxes	-2.5571	.7154	4
FDI	-1.4385	.9264	2
Fuel	-1.7288	.8667	4
FDI	-2.2447	.65763	4
Input cost	-6.3636	1.49E-6*	4

*Significant at the .05 level.

Appendix H

Cointegration test for the analysis of the effect of FDI on exports, dairy sector

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Export	-2.9822	.2715	4
Export(-1)	-1.6617	.8849	4
Export	-1.4053	.9369	4
FDI(-1)	-2.9005	.3089	2
Export	-2.3863	.5827	3
Exchange	-2.4086	.5705	4
Export	-2.1497	.7046	4
Subsidies	-1.8649	.8234	2

*Significant at the .05 level

Appendix I

Cointegration test for the effects of FDI on imports, dairy sector.

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Import	-1.9569	.7890	2
Import(-1)	-1.5111	.9185	2
Import	-2.4801	.5318	2
FDI(-1)	-3.4729	.1055**	4
Import	-1.9120	.8063	2
Exchange	-2.5388	.5086	4
Import	-2.5670	.4831	2
Tariff	-2.9114	.3038	2
Import	-2.1224	.7175	2
Regulations	-2.0124	.7664	2

*Significant at the .05 level. **Significant at the .10 level

Appendix J

Cointegration test for the effects of FDI on TFP growth, Dairy sector

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
TFP	-1.7057	.8732	2
Own(-1)	-2.1689	.6953	2
TFP	-1.3660	.9427	2
For(-1)	-1.6202	.8951	2
TFP	-1.6908	.8772	2
FDI(-1)	-1.8035	.8440	2
TFP	-1.5872	.9027	2
Input costs	-1.4983	.9210	2
TFP	-2.7795	.3689	3
Fuel	-1.8901	.8213	2
TFP	-1.3417	.9461	2
Union	-1.4059	.9368	2

Appendix K

Unit root test for variables used in the grain and oilseeds sector analysis

Dep. Variable (FB&T)	Ind. Variable	t statistic	P value	No. lags
FDI		-1.2986	.8826	4
	FDI(-1)	-1.3211	.8199	2
	Sector	-2.3722	.3944	4
	Tariff	-2.5347	.3113	2
	Subsidies	-1.4803	.9172	3
	Regulations	-2.4681	.3658	3
	Taxes	-2.3600	.4010	2
	Union	-2.6591	.2534	10
	Fuel	-2.8526	.1782	4
	Input cost	-1.9764	.6247	3
Export		-2.6419	.2681	3
	Export(-1)	-1.9276	.6447	3
	Exchange	-2.7374	.2208	4
Import				
	Import(-1)	-1.6491	.7725	2
	Tariff	-1.9153	.7387	2
TFP		-2.3359	.4141	3
	Own (-1)	-3.0768	.1118	4
	For (-1)	-1.2867	.8911	4

Appendix L

Cointegration analysis, determinants of FDI (grain and oilseeds sector)

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
FDI	-2.3647	.5944	4
FDI(-1)	-2.2143	.6729	2
FDI	-2.1173	.7199	4
Sector	-2.1573	.7027	2
FDI	-2.6166	.4559	3
Tariff	-1.1915	.9632	2
FDI	-1.6066	.8983	2
Regulations	-1.7284	.8668	4
FDI	-1.6450	.8891	2
Union	-4.7183	.0025*	4
FDI	-2.1736	.6931	2
Taxes	-2.6053	.4621	4
FDI	-3.3162	.1473	3
Fuel	-2.1921	.6840	2
FDI	-2.7095	.4056	4
Input cost	-2.3762	.5882	4

*Significant at the .05 level

Appendix M

Cointegration test, effect of FDI on exports (grain and oilseeds sector)

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Export	-2.4736	.5348	3
Export(-1)	-4.4228	.0073*	4
Export	-2.5483	.4351	4
FDI(-1)	-2.9906	.2678	4
Export	-2.1740	.6929	4
Exchange	-.1822	.9074	4
Export	-1.9434	.7943	2
Subsidies	-2.4856	.5282	2
Export	-1.6642	.8842	2
Regulations	-1.3840	.9401	4

Significant at the .05 level

Appendix N

Cointegration test, effects of FDI on imports (grain and oilseeds sector)

Coint table Dep. Variable (FB&T)	t stat	P value	No. Lags
Import	-3.2622	.1641	4
Import(-1)	-1.4245	.9338	2
Import	-2.8546	.331	4
FDI(-1)	-1.7202	.8691	3
Import	-1.4018	.9374	2
Exchange	-1.3531	.9445	2
Import	-1.6591	.8854	4
Tariff	-3.6990	.0617*	4

*Significant at the .05 level

Appendix O

Cointegration test, effects of FDI on TFP growth (grain and oilseeds sector)

Dep. Variable (FB&T)	t stat	P value	No. Lags
TFP	-2.1789	.6905	3
Own(-1)	-1.4279	.9333	2
TFP	-2.7416	.3886	2
For(-1)	-2.4240	.5621	4
TFP	-2.7758	.3708	2
FDI(-1)	-3.3155	.1475	2
TFP	-2.8942	.3021	3
Input costs	-2.3154	.5907	3
TFP	-2.9860	.2698	2
Fuel	-1.8716	.8210	2
TFP	-1.7895	.8483	4
Union	-2.9801	.3041	4

Appendix P

Elasticities: Determinants of FDI, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
Sector	.3997	.4232
Tariff	.8478*	.9344*
Subsidies	-.0175	-.028
Union	.0397	.0607

*Significant at the .05 level. **Significant at the .10 level

Appendix Q

Elasticities: Determinants of FDI, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
Sector	.1017*	.1527*
Tariff	.8149	.4110
Subsidies	-.122983	-.1527
Regulations	-.87885	-.9770
Union	-.38422*	-.4445*
Taxes	.2008	.2715
Fuel	.11453	.1607
Input costs	-.1125*	-.2280*

*Significant at the .05 level. **Significant at the .10 level

Appendix R

Elasticities: Determinants of FDI, grain manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
Sector	.3465	.3704
Tariff	.5284*	.6156*
Regulations	.37432	.4197
Union	-.0919	.1421
Taxes	-.02473	.1086
Fuel	.25760	.2714
Input costs	-.19783*	-.2417*

*Significant at the .05 level. **Significant at the .10 level

Appendix S

Elasticities: Effect of FDI on exports, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	.1317*	.2339*
Exchange	-.5972	-.6883
Subsidies	.0367**	.0604**

*Significant at the .05 level. **Significant at the .10 level

Appendix T

Elasticities: Effects of FDI on exports, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	-.0408	.1941
Exchange	.2507	.3461
Subsidies	-.7628	.7961
Regulations	.8981	.9104

*Significant at the .05 level. **Significant at the .10 level

Appendix U

Elasticities: Effects of FDI on exports, grain manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	.3535**	.4971**
Exchange	.15319*	.2437*
Subsidies	.0803	.1187
Regulations	-.19284	-.2557

*Significant at the .05 level. **Significant at the .10 level

Appendix V

Elasticities: Effects of FDI on imports, FB&T sub industry (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	.90813E-5*	.0541*
Exchange	.0675	.2203
Tariffs	-.8032	-.9811

*Significant at the .05 level. **Significant at the .10 leve

Appendix W

Elasticities: Effects of FDI on imports, dairy manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	-.0659	-.1621
Exchange	.3457	.3952
Tariffs	-.3875**	-.4419**
Regulations	-.20165	.2307

*Significant at the .05 level. **Significant at the .10 level

Appendix X

Elasticities: Effects of FDI on imports, grain manufacturing (1987-2001)

Independent variable (FB&T)	Shrot run elasticities	Long run elasticities
FDI(-1)	.2355	.2773
Exchange	.3155	.3326
Tariffs	-.0384	-.0922

*Significant at the .05 level. **Significant at the .10 level

Appendix Y

Effect of FDI on Labour productivity growth, FB&T (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	21.6007	27.0078	.7997	.424	.6816
OWN(-1)	4438.32 (.1503)	1921.94	2.3093	.021*	D.W. "d" statistic 2.6619
FOR(-1)	68.2047 (..0972)	19.2257	3.5475	.000*	D.W. "h" statistic 1.9371
FDI(-1)	.21027E-03 (.2186)	.14454E-03	1.4546	.146	F-test 4.397
CUSTA	3.2964 (.4591)	6.5074	1.5065	.125	
WTO	-1.9008 (.1175)	1.2381	-.5352	.612	
UNION	-.1958 (.0314)	.3354	-2.2983	.095**	
FUEL	-.0886 (.2766)	.01434	.5327	.627	
RHO	-.4154	.2813	-2.9765	.040*	

*Significant at the .05 level. **Significant at the .10 level

Appendix Z

Effect of FDI on Labor productivity growth, Dairy manufacturing sector (1987-2001).

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	-1102.69	498.147	.2135	.827	.7403
OWN(-1)	.5794E-03 (.1076)	.3132E-03	1.4196	.164	D.W. "d" statistic 2.3196
FOR(-1)	.2998E-03 (.1933)	.7159E-03	.4188	.675	D.W. "h" statistic 1.9781
FDI(-1)	.0698 (.2106)	.0314	2.20005	.028*	F-test 5.497
Custa trade values	28.1319 (0382)	7.9713	2.2135	.027*	
WTO trade values	.1534 (.5137)	.01391	.8102	.412	
UNION	-5.9453 (.0481)	2.9656	-2.004	.045*	
FUEL	.04333 (.0153)	.09221	.4699	.638	
INPUT COST	-7.4926 (.2377)	8.7370	-.8576	.391	
Regulations	-16.7939 (-.1533)	106.619	-.1575	.875	
RHO	-.5545	.1294	-4.2825	.000*	

*Significant at the .05 level. **Significant at the .10 level

Appendix AA

Effect of FDI on Labor productivity growth, Grain and oilseeds manuf. sector (1987-2001)

Independent variable (FB&T)	Regression Coefficient & elasticity	Standard error	t-statistic	p-value	Adjusted R^2
C	2.8211	22.3182	.1264	.899	.7024
OWN(-1)	.7415E-03 (.2381)	.5402E-03	2.1089	.035*	**D.W. "d" statistic** 1.8760
FOR(-1)	.3774E-03 (.0493)	.1789E-03	1.3726	.170	**D.W. "h" statistic** 1.7351
FDI(-1)	.11488E-03 (.1732)	.2370E-03	2.4846	.016*	**F-test** 7.297
Custa trade values	-.2288 (.08671)	.3122	-1.7328	.164	
WTO trade values	.8524 (.1430)	1.2447	.6848	.493	
UNION	.8835 (.2275)	.4041	.02184	.983	
FUEL	-2.1085 (.0541)	2.4614	-7.9484	.001*	
INPUT COST	-3.1248 (.1974)	20.6465	-2.3275	.080**	
Regulations	.379653 (.0285)	.3160	1.2011	.230	
RHO	.3158	.4311	2.2732	.028*	

*Significant at the .05 level. **Significant at the .10 level

Mergers and acquisitions in the Canadian Dairy industry.

	2000	2000	2000	2000	2000	2000
Target	Cayer-J.C.B. Group Inc.	Eskimo Pie Corp.	Dairyworld Foods	Groupe Lactel	Delicious Brands Inc.	Baked Goods Processing
Location	St Raymond, Que.	Virginia, U.S.	Vancouver, B.C.	Boucherville, Que.	Illinois, U.S	U.S.
Acquirer	Saputo Inc.	Yogen Fruz World-Wide Inc. / Cool Brands International Inc.	Saputo Inc.	Agropur, Co-operative Agro-Alimentaire	Parmalat Canada Ltd.	George Weston Ltd.
Location	Montreal, Que.	Markham, Ont.	St. Leonard, Que.	Granby, Que.	Toronto, Ont.	Toronto, Ont.
Vendor			Agrifoods International Co-operative Ltd.			Norse dairy Systems
Location			Vancouver, B.C.			Ohio, U.S.
Estimated Price (million C$)	$13.7	$53.45	$407.00	Not Disclosed	$38	Not disclosed
Classification	Change in control	Change in control, tender offer	Change in control	Change in control	Change in control	Change in control

Mergers and acquisitions in the Canadian Dairy industry.

	1999	1999	1999
Target	Eskimo Pie Corp.	Honey Hill Farms Yougurt	Culinar Inc.
Location	Virginia, U.S.	California, U.S.	Montreal, Que.
Acquirer	Yogen Fruz World-Wide Inc.	Yogen Fruz World-Wide Inc.	Saputo Group Inc.
Location	Toronto, Ont.	Toronto, Ont.	Montreal, Que.
Vendor			
Location			
Estimated Price (million C$)	$69.67	N/A	$283

Mergers and acquisitions in the Canadian Dairy industry.

	1998	1998	1998	1998	1998	1998	1998
Target	Fieldfresh Farms Inc.	Froma-Dar Inc.	McCain Refrigerated Foods Inc.	Bari Cheese Ltd. / Riverside Cheese & Butter Inc.	Waterford Food Products Inc. / Avonmore Cheese Inc.	Ice Cream Churn Inc. & Ice Cr. Churn Enterprises Inc.	Eskimo Pie Corp.
Location	St Oakville, Ont	Quebec	Ontario	Vancouver, B.C./Trenton, Ont.	U.S / Montreal, Que.	U.S.	US
Acquirer	George Weston, Ltd.	Saputo Group Inc.	Dairyworld Foods	Saputo Inc.	Saputo, Inc.	Yogen Fruz World-Wide Inc.	Yogen Fruz World-Wide Inc.
Location	Toronto, Ont.	Montreal, Que.	Burnaby, B.C.	Montreal, Que.	Montreal, Que.	Toronto, Ont.	Toronto, Ont.
Vendor	Oshawa Group Ltd		McCain Foods Ltd.		Avonmore Waterford Group		
Location	Etobicoke, Ont.		Florenceville, N.B		U.K.		
Estimated Price	$Not disclosed	$4.4	$Not disclosed	$11.9	$50.5	$65	$69.6
Classification	Change in control	Acquisition	Change in control	Change in control	Change in control	Change in control	Change in control/ tender offer

Mergers and acquisitions in the Canadian Dairy industry.

	1997	1997	1997	1997	1997	1997
Target	Ault Foods Ltd.	Dairyworld Foods	Beatrice Foods Inc.	Frozen Product Division	Milk Business (Que)	Stella Foods Inc.
Location	Etobicoke, Ont.	Bournaby, B.C.	Etobicoke,Ontario.	Ontario	Montreal, Ont.	U.S.
Acquirer	Parmalat Finanziaria Spa	Nestle Canada Ltd	Parmalat Finanziaria SpA / Citicorp	Nestle Canada Ltd.	Agropur, Cooperative Agro-Alimentaire	Saputo Inc.
Location	Italy	Toronto, Ont.	Italy / U.S	Toronto, Ont.	Quebec	Montreal, Que.
Vendor				Ault Foods Ltd.	Ault Foods Ltd.	Speciality Foods Ltd.
Location				Etobicoke, Ont.	Etobicoke, Ont.	Vancouver, B.C
Estimated Price (million C$)	$412	Not disclosed	$290	$221	$145	$563
Classification	Change in control, tender offer	Change in control/Acquisition	Change in control	Change in control/acquisition	Change in control	Change in control

Mergers and acquisitions in the Canadian Dairy industry.

	1996	1996	1996	1995	1995	1995
Target	Astro dairy products Ltd.	Conlac Corp.	Greater pacific food holdings Inc.	Agrifoods International Co-operative Ltd. / Dairy Producers Co-operatives Ltd.	Brant Dairy	Cheese manufacturing Division
Location	Toronto, Ont.	Quebec	U.S.	B.C. / Sk.	Ontario	Ontario
Acquirer	Investor group	Solvay Kingswood Inc.	Yogen Fruz World-Wide Inc.		Natrel Inc.	Ault Foods Ltd.
Location		Toronto, Ont.	Ontario		Quebec	Etobicoke, Ont.
Vendor		Ault Foods Ltd				Schneider Corp.
Location		Etobicoke, Ont.				Ontario
Estimated Price (million C$)	Not disclosed	Not disclosed	Not disclosed	Not disclosed	Not disclosed	$15
Classification	Change in control	Change in control	Change in control	Merger	Change in control	Acquisition

Mergers and acquisitions in the Canadian Dairy industry.

	1994	1992	1992	1992	1992
Target	Ice Cream Manufacturing Plants	Demeter Agro	Longlife of Canada / Uniondale cheese	Central Alberta Dairy pool / Dairy Producers Cooperative / Fraser Valley Milk Producers / Northern Alberta Dairy pool	Ault Foods Limited
Location	Simcoe, Ont.	Alberta	Ontario	Ab./Sk/ B.c. / Ab.	Ontario
Acquirer	Unilever Canada Ltd.	Alberta Wheat Pool	Gaylea Foods Cooperative Ltd		John Labatt
Location	Toronto, Ont.	Alberta	Ontario		
Vendor	Beatrice Foods Inc.				
Location	Etobicoke, Ont.				
Estimated Price (million C$)	Not disclosed	Not disclosed			Not disclosed
Classification		Change in control	Acquisition	Merger (Now Dairyworld)	Acquisition

Mergers and acquisitions in the Canadian Dairy industry.

	1991	1991	1991	1990	1990	1990
Target	Anco Foods Products Ltd.	Black Diamond Cheese	Beatrice Foods Inc	William Nielson Ltd	Ault Foods Ltd.	Laiterie Guaranteed Ltee
Location		Ontario		Ontario	Ontario	Quebec
Acquirer	Agropur Cooperative Agro-Alimentaire	John Labatt Ltd.	Merril Lynch Capital Partners	John Labbatt Ltd.	Manco Dairies	John Labbatt Ltd.
Location	Quebec	Ontario	U.S.	Ontario	Manitoba	Ontario
Vendor		Canada Packers		George weston Ltd.	John Labatt Ltd.	
Location		Ontario			Ontario	
Estimated Price (million C$)		Not disclosed	$475	Not disclosed	Not disclosed	Not disclosed
Classification	Asset sale	Acquisition	Acquisition/tender offer	Asset sale	Acquisition	License

Appendix AC

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	2000	2000	2000
Target	Pro Form Feeds	AgValue Brokers Inc.	Alix Fertilizer Ltd.
Location	Chilliwack, B.C.	Calgary, Ab.	Alberta
Acquirer	UGG Ltd.	Verida Internet Corp.	UGG Ltd.
Location	Winnipeg, Manitoba	California, U.S.	Winnipeg, Manitoba.
Vendor	Agro Pacific Industries Ltd.		
Location	Chilliwack, BC.		
Estimated Price (million C$)	Not disclosed	$1.4	Not disclosed
Classification		Change in control	Change in control

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1999	1999	1999
Target	Pattison Bros. Agro Ltd.	Paradise Hill Agro Ltd.	Better Buy Agro Ltd.
Location	Lemberg, Sk.	Saskatchewan	Congress, Sk.
Acquirer	UGG Ltd.	UGG Ltd.	UGG Ltd.
Location	Winnipeg, Manitoba	Winnipeg, Manitoba	Winnipeg, Manitoba.
Vendor			
Location			
Estimated Price (million C$)	Not disclosed	Not disclosed	Not disclosed
Classification	Change in control	Change in control	Change in control

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1998	1998	1998	1998	1998	1998	1998
Target	Humboldt Flour Mills Inc.	Flour Mill (Que)	Western feedmills LTD.	Can-Oat Milling	Alberta Wheat pool / Manitoba pool Elevators	Agro Pacific Industries Ltd.	Twin Hills Fertilizers Ltd.
Location	Humboldt, Sk.	Montreal, Que.	Regina, Sk.	Portage La Prairie, Mb.	Calgary , Ab/ Winnipeg, Mb.	Chilliwack, B.C.	Hagen, Sk.
Acquirer	Saskatchewan Wheat Pool	Cereal Foods Canada Inc.	Saskatchewan Wheat Pool	Saskatechewan Wheat Pool		Saskatechewan Wheat Pool	UGG Ltd.
Location	Regina, Sk.		Regina, Sk.	Regina. Sk.		Regina, Sk.	Winnipeg, Mb.
Vendor		Archer Daniels Midland Co.					
Location		Illinois, U.S.					
Estimated Price (million C$)	$18.8	Not disclosed	Not disclosed	$62	Not disclosed	$6	Not disclosed
Classification	Change in control, tender offer		Change in control	Change in control/acquisition	Merger	Stake Purchase (no change in control)	Change in control

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1997	1997	1997	1997	1997	1997
Target	Maple Leaf Mills Inc.	UGG Ltd.	UGG Ltd.	UGG Ltd.	UGG Ltd.	UGG Ltd.
Location	Ontario	Winnipeg, Mb.	Winnipeg, Sk..	Winnipeg, Sk..	Winnipeg, Sk..	Winnipeg, Sk..
Acquirer	Archer daniels Midland	Alberta Wheat Pool / Manitoba Pool Elevators	Alberta Wheat Pool / Manitoba Pool Elevators	Archer daniels Midland		Marubeni Corp.
Location	US	Alberta/Manitoba	Alberta/Manitoba	U.S.		Japan
Vendor	ConAgra Inc / Maple Leaf Foods Inc.				Alberta Wheat Pool / Manitoba Pool Elevators	
Location	U.S. / Ontario				Alberta/Manitoba	
Estimated Price (million C$)	$32.6	$11.5	$171.8	$113	$19	$12
Classification	Acquisition	Stake purchase (no change in control)	Change in control, tender offer	Stake purchase (no change in control)	Share repurchase (no change in control)	Stake purchase (no change in control)

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1996	1996	1996	1996	1995
Target	Canbra Foods Ltd.	Agricultural processing Operations (Ab)	Belize mills Ltd./Barbados Mills Ltd.	Can-Oat Milling	Hart Feeds & Farm Supply
Location	Alberta	Alberta	Belize/Barbados	Manitoba.	Manitoba
Acquirer	Pocklington Financial Corp. Ltd.	CIC (Canola Industry Canada Inc.)	Archer daniels Midland	Saskatchewan Wheat pool	UGG Ltd.
Location	Alberta	Nisku, Alberta.	U.S	Regina, Sk.	Manitoba
Vendor			Maple Leaf Foods Inc.		
Location			Ontario		
Estimated Price (million C$)	$31	Not disclosed	Not disclosed	Not disclosed	Not disclosed
Classification	Acquisition		Change in control, tender offer	Stake purchase (no change in control)	Acquisition

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1994	1994	1994	1993
Target	Northern Lite Canola	Weston Foods	Taylor Grain Division	Demeter Agro
Location	Alberta	Ontario	Ontario	Alberta
Acquirer	CIC Canola Industries Canada	Saskatchewan Wheat Pool/Dawn Foods canada	London agricultural Commodities Inc.	Alberta Wheat Pool
Location	Alberta	Regina, Sk	Ontario	Alberta
Vendor	Government of Alberta	Weston Foods	Dover Industries Inc.	
Location	Alberta	Ontario	Ontario	
Estimated Price (million C$)	$6	Not disclosed	Not disclosed	Not disclosed
Classification	Change in control/ Acquisition			Change in control

Mergers and acquisitions in the Canadian Grain and oilseeds industry.

	1992	1992	1991	1990	1990
Target	JL Foods and Ogilvie Flour Unit	Oil Division	Drumond Brewing Co. Ltd.	Canada Packers Inc.	Maple Leaf Mills Ltd.
Location			Alberta	Ontario	Ontario
Acquirer	Archer Daniels Midland	Canamera Foods	Alberta Wheat Pool	Hillsdown Holdings plc.	Maple Leaf Ogilvie
Location	US		Alberta	U.K.	
Vendor	John Labatt	Maple Leaf Foods Inc.			John Labatt
Location					Ontario
Estimated Price (million C$)	$1.4	Not disclosed	Not disclosed	$120	$145
Classification	Asset sale	Asset sale	Acquisition of controlling interest	Merger	Merger

Appendix AD

Primary Elevators (summary by Company)

	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02
AgPro Grain							X	X	X	X	X	X	X	X	X	X	X	
Agricore Ltd.															X	X	X	
Agricore United Ltd.																		X
Alberta Food Products							X											
Alberta Wheat Pool	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Benson Quinn										X	X							
Canada Malting C																X	X	
CanAmera Foods								X	X	X	X	X						
Canbra Foods							X	X	X	X	X	X	X					
Cargill Grain Company	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CMI Terminal Joint Venture																	X	X
ConAgra Limited							X	X						X	X	X	X	X
Continental Grain							X	X	X	X	X	X	X	X				
Delmar Commodities													X	X	X	X	X	X
Demeter Agro								X										
Dominion Malting Ltd.																	X	
Fillmore seeds																	X	X
Grain Solutions Inc.																		X
Great Northern Grain Terminals Ltd.							X	X	X	X	X	X	X	X	X	X	X	X
Great Sandhills Terminal Ltd.															X	X	X	X
Jhonson Seeds, S.S., Ltd.							X	X	X	X	X	X	X	X	X	X	X	X
Keystone Grain								X	X	X		X						
Louis Dreyfus												X	X	X	X	X	X	X

Mainline Terminal Ltd.														X	X	X	X	X
Manitoba Inc.															X	X		
Manitoba Pool Elevators	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Mid-Sask Terminal Ltd.														X	X	X	X	X
North East Terminal									X	X	X	X	X	X	X	X	X	X
North West Terminal														X	X	X	X	X
Northern Lite Canola											X	X	X					
Palliser Grain Co. Ltd.							X	X	X	X	X	X	X	X				
Parrish & Heimbecker, Limited	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Peterson & Sons Limited, N.M.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pioneer Grain Company, Limited	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Prairie Mountain Agri. Ltd.															X	X	X	X
Prairie West Terminal															X	X	X	X
Ritchie Patrick - Viking Grain												X	X	X	X	X	X	
Saskatchewan Wheat Pool	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SeedTec Ltd.												X	X	X	X	X	X	X
South West Terminal													X	X	X	X	X	X
Terminal 22 Inc.															X	X	X	X
Tri Lake Agri Limited.															X	X	X	X
Stow-Agro									X	X								
United Grain Growers Limited	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Walker Seeds Ltd.															X	X		
Weyburn Inland Terminals							X	X	X	X	X	X	X	X		X	X	X
Other Licensed Companies (Number of operating elevators)	19	16	21	23	24	23												
Total operating units	1819	1768	1713	1666	1592	1532	1539	1498	1465	1409	1340	1199	1153	1058	976	848	627	425